NOVEMBER
1932

FLEET OWNER

THE FERGUSON PUBLISHING CO., 50 WEST ST., NEW YORK, N.Y.

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DETROIT

FEATURES OF THIS ISSUE THAT YOU SHOULD READ:

HOW United Parcel Service of New York City Keeps Its Fleet on the Road ● To Farm Out or Not to Farm Out, By L. V. Newton ● A California Express Fleet's System as Regards Operation and Maintenance ● How to Step Up Your Tire Mileage ● Power Prover, a New Service ● New Model Announcements ● Trouble Shooter ● Question of the Month Club ● And Our Usual Departments ●

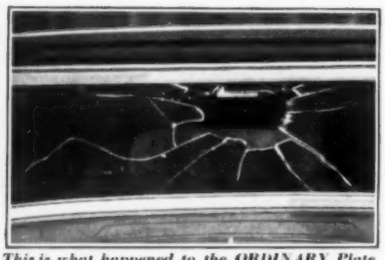
WARNING!

45% of the motorists* who are injured in automobile accidents are cut by broken glass. Passengers who pay for safe transportation *must be protected* from this menacing danger.

**This figure is obtained from a recent survey in which 147,100 motorists were questioned.*

We threw a brickbat, full force, at the windshield of a car equipped with Libbey·Owens·Ford Safety Glass. A high speed camera caught it just as it struck. Notice how the glass merely *cracked* under the terrific blow. *It did not shatter and fly.* The brickbat actually *bounced away* from the Safety Glass windshield.

LIBBEY·OWENS·FORD SAFETY GLASS IS THE BEST AVAILABLE PROTECTION FOR YOUR PASSENGERS



This is what happened to the ORDINARY Plate Glass Windshield. The brickbat went right through it. The great, gaping hole shows how the pieces of broken, flying glass were scattered through the air and into the car.

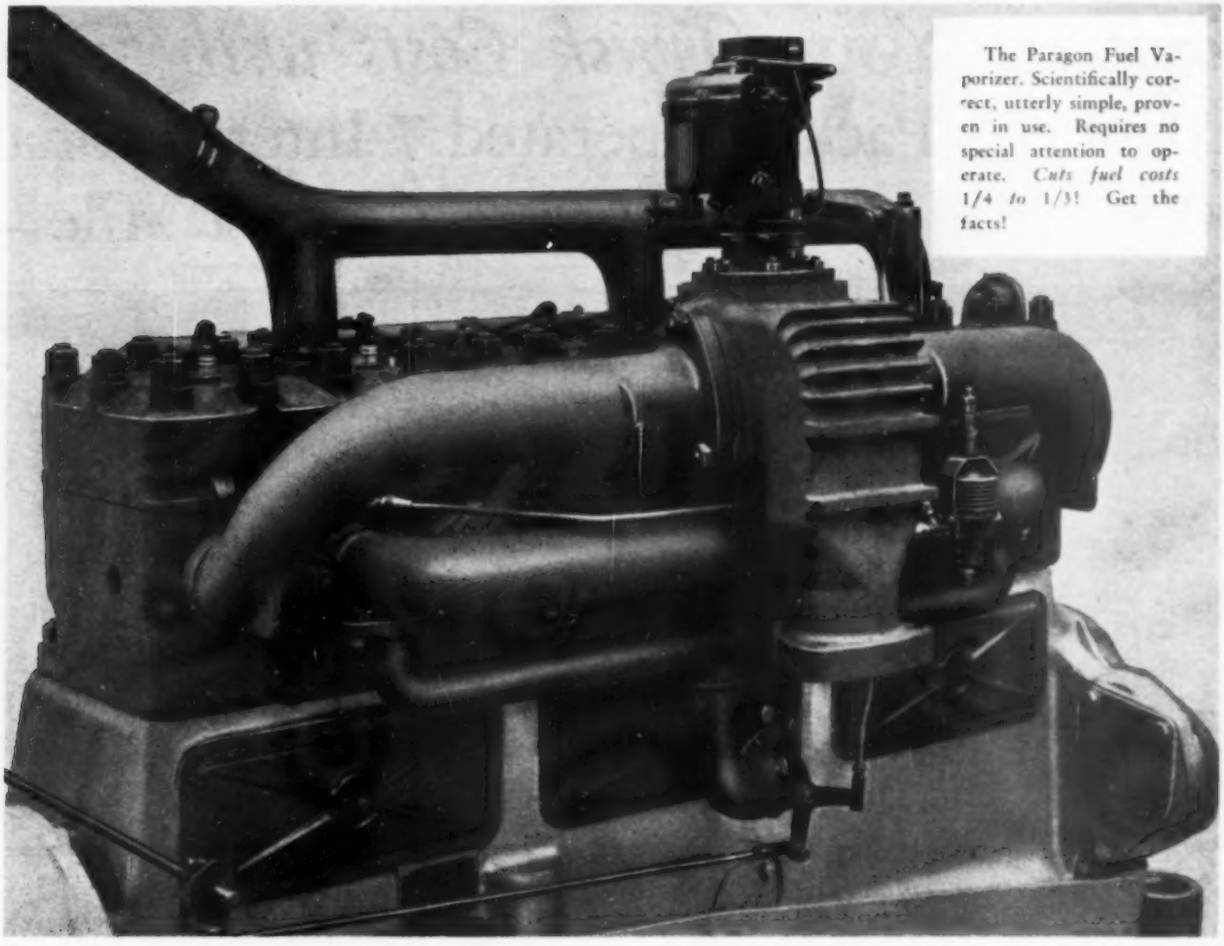
This is all that happened to the Libbey·Owens·Ford Safety Glass Windshield. The patented transparent adhesive and the thin, clear transparent plastic between the two sheets of fine plate glass prevented it from flying.

After this dramatic exhibition of the terrific impact that L·O·F Safety Glass will resist *and still protect*, an *ordinary* Plate Glass windshield was substituted in the car. When the brickbat struck the *ordinary* glass, there was a terrifying crash and jagged, razor-edged, danger-dealing chunks showered the interior of the car. Those are the flying daggers that cause so many injuries . . . *needless* injuries that often have very serious, even fatal, results. Could anything prove more convincingly the protective value of L·O·F Safety Glass? Can any fleet owner or operator afford to shirk his responsibility to the public by neglecting to supply this essential safeguard? Libbey·Owens·Ford Safety Glass is used by Packard, Graham, Studebaker, Franklin, Reo, Willys, Willys-Knight, Ford, Cadillac, La Salle, Lincoln and Nash; in Dietrich and Le Baron Custom Bodies, Reo Speed Wagons, Twin Coaches, Brill Trolley Buses, Cincinnati Trackless Trolley Coaches, Bender Bus Bodies, Hackney & Springfield School and Passenger Bus Bodies, White School Buses, York-Hoover School Bus Bodies, Crown School and Motor Coach Bodies, Ford School Buses, Stinson and Stearman Aircraft, Car Wood Boats, Matthews Cruisers and Chris-Craft Cruisers and Runabouts.

•

LIBBEY-OWENS-FORD GLASS COMPANY, TOLEDO, OHIO, *manufacturers of Highest Quality Flat Drawn Window Glass, Polished Plate Glass and Safety Glass; also distributors of Figured and Wire Glass manufactured by the Blue Ridge Glass Corporation of Kingsport, Tennessee.*

LIBBEY·OWENS·FORD SAFETY GLASS



The Paragon Fuel Vaporizer. Scientifically correct, utterly simple, proven in use. Requires no special attention to operate. *Cuts fuel costs 1/4 to 1/3!* Get the facts!

FUEL COST SLASHED ¼ to ⅓
By PARAGON VAPORIZER

Findings of quarter-million mile all-season road observation proves Paragon Vaporizer economy and utter simplicity

Probably this is the biggest piece of good news this year for truck operators. This may prove the salvation of many commercial haulers, and means a tremendous saving for all heavy duty engine users. Get these facts!

For more than a year Paragon Fuel Vaporizers have been used in regular service. These are the net results: (1) Paragons were easily installed. (2) Required no special attention. (3) Did not increase maintenance cost. (4) *Chopped fuel bills more than 30 per cent!*

Today, more than ever before, tremendous savings like these are vitally important. Such an economy puts *profit* into low-revenue hauling, saves heavily for all trucks, *saves one-quarter to one-third of a major operating expense of heavy duty engine operation!* Can any truck operator afford to ignore such help?

In his own or his company's interest, every heavy duty engine operator *must* get the Paragon facts. You will be given the whole story, plus a summary of findings which were not only compiled in a laboratory but were gathered in long, everyday road experience. Start toward important savings today! Write now for these Paragon findings.

The Paragon Fuel Vaporizer is the most practical, finished and proven device ever offered this industry. Its advent marks the beginning of amazing and very desirable savings for the whole heavy duty engine field. Write, today, for your set of Paragon Fuel Vaporizer facts and figures.

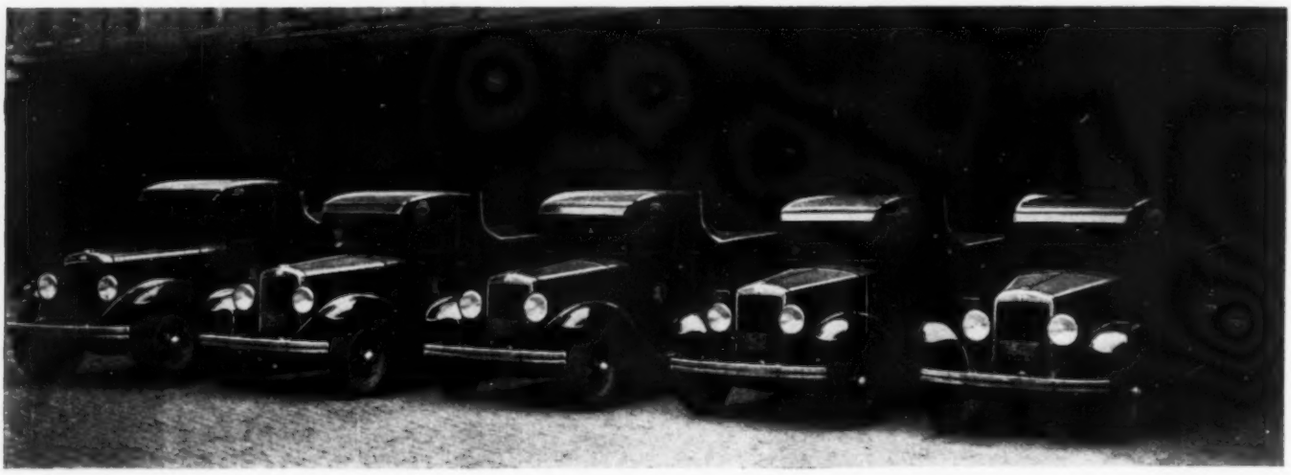
A Paragon under the Hood can turn loss into Profit!

Manufactured Exclusively By

CLIMAX ENGINEERING COMPANY
111 WEST MONROE STREET CHICAGO, ILL.

Say "I saw it in FLEET OWNER"—It Helps!

Compare Your *Truck Costs with This:* Pittsburgh Packer Operated 7 Internationals 110,358 Miles for Only 5 9/10 Cents a Mile



Five of the Internationals in the Fleet That Made This Good Showing

THE Pittsburgh Provision & Packing Co., Pittsburgh, Pa., made an analysis of the operating costs of its 7 International Trucks over a six-month period and found these trucks were operating for only 5 9/10 cents a mile. *Most of these trucks had traveled between 30,000 and 40,000 miles before this analysis was made.* There are four 1½-ton trucks, two 2-ton trucks, and one 3-ton truck included in this report. They are on out-of-town service, operating in a radius of 100 miles from Pittsburgh.

Depreciation is charged at the rate of 33⅓% of the undepreciated balance at the end of the year. License fees are not charged against the trucks by this company.

Study this cost analysis and compare this low operating cost with your own trucks. If you wish to have the costs on the individual trucks, write to us. The Pittsburgh Provision & Packing Company is one of hundreds of truck users who know from their records that Internationals are the most economical trucks to operate. Ask the nearest of 188 Company-owned branches in the United States and Canada, or an International dealer, for a demonstration. Sizes from ¾-ton to 7½-ton.

COST ANALYSIS

on 7 International Trucks owned by the Pittsburgh Provision & Packing Company Pittsburgh, Pa.

FIXED COSTS

Depreciation	$2,137.20
Insurance	447.00
Interest	34.52
Total Fixed Costs	**$2,618.72**

VARIABLE COSTS

Gasoline and Oil	$1,866.86
Tire Expense	1,230.94
Garage and Repairs—Parts, Labor	834.41
Total Variable Costs	**$3,932.21**
Total Cost Less Drivers' Wages	**$6,550.93**
Number of Miles Traveled	110,358
Number of Hours Operated	12,792
Number of Pounds Hauled	3,345,544
Cost Per Mile	**5 9/10 cents**

INTERNATIONAL HARVESTER COMPANY
OF AMERICA
(Incorporated)
606 So. Michigan Ave. Chicago, Illinois

INTERNATIONAL

INTERNATIONAL TRUCKS

Say "I saw it in FLEET OWNER"—It Helps!

The

FLEET OWNER

Published Monthly in the interests of Automotive Fleet Owners who maintain their own Repair and Service Shops and devoted to the better Operation and Maintenance of Truck, Trailer, Bus, Passenger Car, Taxicab and all Automotive Fleets.

Vol. 9 New York, November, 1932 No. 5

Table of Contents

Most Efficient or Most Economical?	Editorial	7
Maintaining a Parcel-Delivery Fleet	W. D. Bixby	8
More About Self-Maintenance	L. V. Newton	14
Straight-Line Methods Reduce Costs	S. J. Beer	16
How to Train Driver Personnel	L. J. Mathot	18
How to Increase Tire Mileage	E. K. Smith	22
Tank Truck "Faws Down" but "No Boom"!		24
Cities Service Offers Power Prover		28
Carries Racing Car Cross Country		30
New 1½-Tonner by Diamond T		30
Truck-Built Trailers by G. M. T		31
FWD Offers 1933 Models		31
Question-of-the-Month Club		32-33
New 400 Cu. In. G. M. Truck Engine		34
Vaporizer Burns Furnace Oil in Trucks		35
Trouble Shooters' Department		43
What Do You Read?		45
Bulletins of the Month		47
New Merchandise for Road and Shop		48-49
Index to Advertisers		50

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■

GASKET GOO is made in only ONE GRADE because one grade answers every purpose.

Owing to our original formula, GASKET GOO does not cement the joint together in such a way as to make trouble when you want to open it up. So you need no softer grade. It sets firmly enough to keep all leaks from starting. So you need no grade that sets like flint.

Just keep GASKET GOO on hand, and you're ready to leakproof any joint.

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PEP GRINDING COMPOUND in ONE GRADE starts and finishes any automotive grinding job.

The medium grade of PEP cuts faster than the "coarse" and finishes smoother than the "fine" of compounds whose makers want you to use two grades for motor service work. Why bother with two?

Would you put grease on a grindstone to grind an axe? No oil or grease in PEP.

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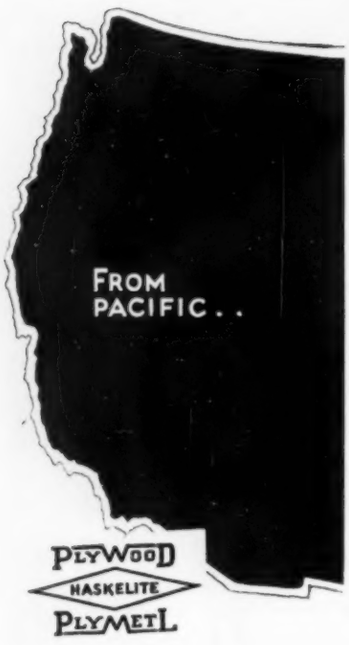
Check Free Sample Wanted ☐ GASKET GOO ☐ PEP GRINDING COMPOUND

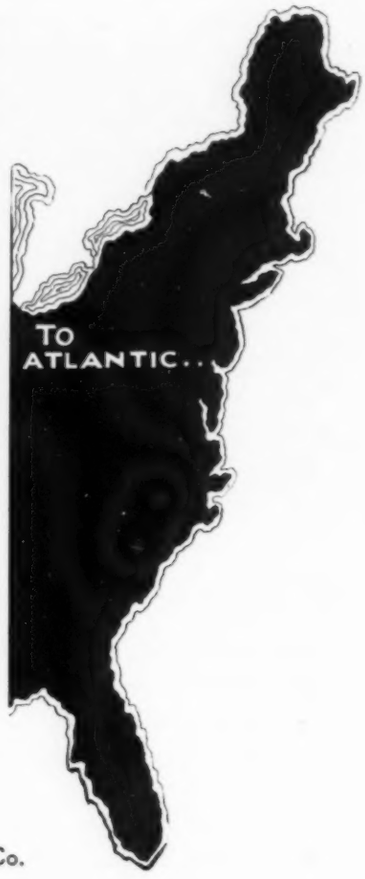
Name_____

Address_____ F. O.-11

The Dairy Industry Knows PLYMETL EFFICIENCY!



PLYMETL paneled bodies meet the rigid requirements of the dairy industry with unsurpassed efficiency. For large refrigerator bodies PLYMETL, though light in weight, provides great strength, insulation, and smooth surface for a fine finish. . . . These, and other qualities are responsible for the predominance of PLYMETL refrigerator bodies at the recent Dairy Show held in Detroit . . . PLYMETL paneled milk delivery bodies can be constructed without intermediate uprights, reducing dead weight to a minimum and increasing loading space. PLYMETL bodies are economical to operate and easy on maintenance costs. . . . If you will send us the name of your bodybuilder, we shall be glad to send him complete blueprints showing typical light weight PLYMETL milk delivery bodies.



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New York Distributor
Esdorn Lumber Corporation

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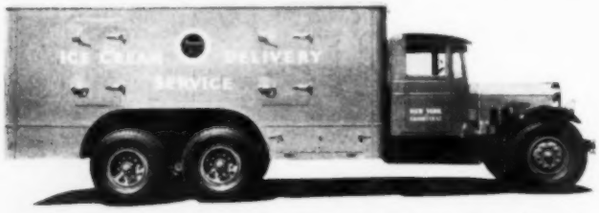
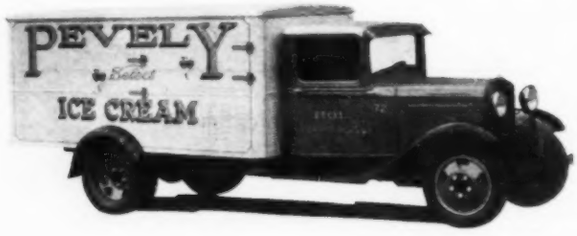




Above—"2000 gallon" Borden Truck built by John Albert, Long Island City.
At right—"Show Model" exhibited by Anheuser-Busch, St. Louis.

PLYMETL PANELED BODIES MEAN *Better* BODIES

Matthews Frechtling delivery units built by Finn's Auto Body Shop, Cincinnati, Ohio.
Cincinnati Distributor, Miami Rubber Company.

VOL. 9
NO. 5

The FLEET OWNER

NOVEMBER
1932

Most Efficient? or Most Economical? . . . . . .

THAT is often the question, when it comes to determining the best carburetor adjustment on your fleet of trucks, busses, taxicabs or passenger cars.

¶ Maintenance men know that they can "lean down" a carburetor so that the minimum of fuel will be consumed. Also that they can "open up" the adjustment so that better acceleration and hill-climbing ability will be obtained. But where is the happy medium of carburetor adjustment?

¶ Here is where the exhaust gas analyzer fits into the picture. The subject seems to be on the tongues of fleet men everywhere. At luncheons, in conferences, at meetings; even on the "5:15" (or is it the "6:15", now that we are all getting back to work?).

¶ While the exhaust gas analyzer is not brand new, having been used by several very large fleets for a number of years, it is only recently that instruments of this kind have been developed in simple, practicable, and inexpensive form.

¶ Exhaust gas analyzers, by sampling the engine exhaust, make possible that "happy medium" carburetor adjustment, previously mentioned. If properly used, they will point the way to higher gasoline mileage, higher oil mileage, and more satisfactory road operation. Indirect benefits accruing would include the minimizing of carbon formation, improvement of compression, the lessening of crankcase dilution and its consequent ills—all of which tend to lengthen engine life and insure more reliable service. Then too, the dangers of carbon monoxide will be appreciably reduced.

The Editor's Page

¶ Not that it is our job to take up the war-cry of the merchants, vendors or makers of gas analyzing machines. BUT—The world does not stand still and if we don't keep up with it we will soon be in the discard. As we said before, there are gas analyzers now available to fleet operators. We'll be glad to see that you get complete literature on them, sans obligation, sans high pressure and sans salesmen. Just drop a line to the Editor and we'll bet on the one nearest you to reach you first.

Maintaining a Parcel-Delivery Fleet

Some of the Factors That Affect Truck Maintenance Costs in Keeping the Delivery Fleets of United Parcel Service on the Road

By Willard D. Bixby,

Manager of Motor Equipment, United Parcel Service, New York City

THERE are several factors affecting truck maintenance costs, among which may be mentioned the following: A clean and well-ventilated shop; selection and training of personnel; proper tools and equipment; standardization of motor equipment; adequate lubrication; selection and care of tires; control of gasoline consumption; and last but not least, cost keeping. Some of these factors, as applied to our fleet, will be discussed in this article. A future article will touch on some of the others.

During my association with United Parcel Service I have had an opportunity to study the maintenance of trucks in fleets both large and small. These fleets range in size from a 40 car fleet in Portland, Oregon, to one of approximately 500 cars maintained in Greater New York under the direct supervision of Joe E. McLaughlin. As a result of observation of these fleets, I have come to the conclusion that the principal factors involved in truck maintenance remain the same in all fleets regardless of size. After all, a large fleet can really be considered a consolidation of a number of small ones.

Before anything can be done in the way of maintenance, we must provide space to work in. This space or shop has a very important bearing on our whole problem. Men spend a large part of their lives in this shop and the surroundings should be as pleasant as possible.

There should be ample ventilation, particularly important being some effective means of disposing of exhaust gases. The place should be warm in winter and as cool as possible in summer. There must be good light. The floors should be kept spotlessly clean. Work-benches should be of metal or at least metal-covered and should be kept clean and orderly. A work-bench should not be allowed to become a stock-room or a storage space for old parts. Every man should have assigned to him a definite bench space with a tool-drawer and a vise.

The cleaner and more orderly the shop is, the better will be the attitude of the men and the better will be the quality of the work turned out. It is easier to get production from men who are working in a place they would dislike to leave, than from those working in a damp, dirty shop where they have to lie on an oil-soaked floor while working under a car and where they have old, splintered and dirty benches to work on.

It is better to have our men think they are working in the best shop in town than to have them feel that it is just another place to work; no worse perhaps and probably no better than any other. A good shop attracts and keeps good men. Good wages paid good men result in lower costs than poor wages paid poor or medium class men, provided the supervision is adequate. With shop conditions and equipment good, we can expect production and we must get it.

Now we will touch on the selection and the training of our shop personnel. We must use care in the initial selection and hiring, as it is sometimes unpleasant and difficult to drop from the payroll men with whom we have become acquainted and whom we may like to sympathize with. It is far better to take time to investigate a man's credentials or references and to talk to his former employer before hiring him.

If he has a good record we must go still further. We must be sure that he is of the type who works cheerfully and gets along with the other men. He must be suited to the job in mind. It takes a far different type of man to make running repairs on cars

(Please turn to page following)

Keep Him Satisfied!

THE driver is an important factor in the operation and maintenance of this fleet.

United Parcel Service believes that it is to the driver that they look for the satisfactory working of their vehicles.

He is the one who delivers the packages and the value of a piece of equipment is largely dependent on the amount of work he accomplishes. They believe it to be one of the first considerations of the shop to give the driver service and keep him satisfied.

Designed by

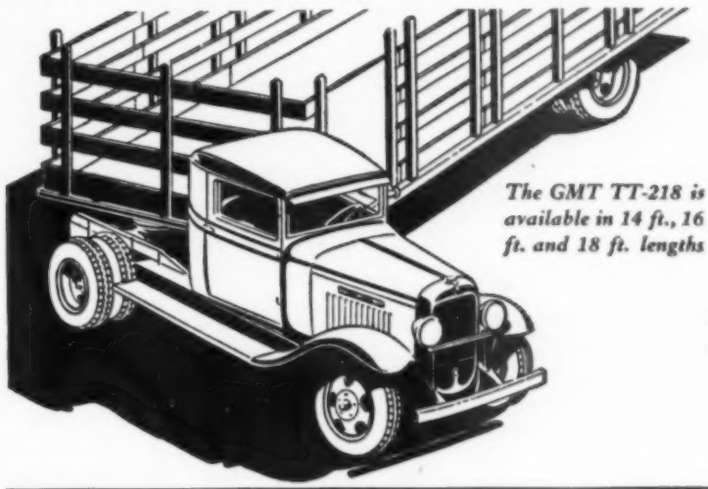
TRUCK ENGINEERS

BUILT LIKE A TRUCK

THE MODERN GMT TRAILER

IS ROAD-WORTHY AND DEPENDABLE

A Complete GMT Tractor and Trailer Outfit for 5-Ton Payloads Costs as Little as $1547



The GMT TT-218 is available in 14 ft., 16 ft. and 18 ft. lengths

Revise your ideas about trailers! GMT has applied truck engineering to trailer design — truck manufacturing methods to trailer production. In short, GMT has made today's trailer as rugged and reliable a hauling unit as the modern GMT truck!

Take the "baby" of the line, for example. Pressed steel construction throughout makes the TT-218 3-5 ton semi-trailer both stronger and lighter. Many wearing parts, including the truck-type brakes, are interchangeable with GMT truck parts. The simple, trouble-proof "One-Man" fifth wheel means speed and economy in handling. Standard, low-priced bodies, engineered to the chassis, are available. And the 14 foot length TT-218 chassis lists at only $347, f. o. b. Pontiac!

Get the complete facts on GMT tractor-trailer equipment from your nearest GMT representative.

GMT TRACTOR-TRAILERS

—A TYPE AND SIZE FOR EVERY JOB FROM 3 TO 20 TONS

Check These Advantages:

Many wearing parts of tractor and trailer are interchangeable.

•

GMT's have a greater service representation than all other leading makes of trailers combined.

•

Truck-type brakes are used on GMT trailers. Power actuation available.

•

"One-man" fifth wheel enables the driver to couple and uncouple without assistance.

•

GMT "truck" design and manufacturing precision mean reduced weight, greater strength, greater payload capacity, and longer life.

GENERAL MOTORS TRUCK COMPANY
Pontiac, Michigan

Send me complete information on GMT truck-built trailers of the following capacities:_____

Name_____

Address_____

City and State_____ (35-K)

GENERAL MOTORS TRUCKS AND TRAILERS

FACTORS AFFECTING MAINTENANCE *(Continued)*

in an isolated fleet in a remote station than to work on a bench or at a lathe in the main shop. Some men are adapted to rough work, like replacing springs and axles, others have natural talent at brake adjusting, ignition, carburetion, or trouble shooting.

One of the greatest problems for the superintendent of maintenance or the shop foreman to solve is the selection of good men and the placing of them where they will work to the best advantage. Some men who are only or possibly even poor hands at overhauling units may be excellent at keeping up running repairs on an isolated fleet.

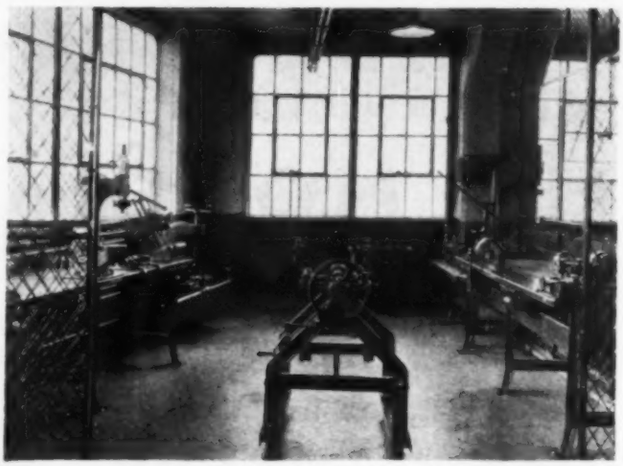
When picking mechanics to work in outlying stations, I try to select men who have had department store experience and who have had contact with drivers or who have been drivers themselves. These men understand to some extent the problems drivers have to contend with in their daily work and are more likely to render the kind of service needed to keep a delivery fleet on schedule.

The driver is an important factor in our scheme of things. It is to him we must look to work our cars to advantage. He is the one who delivers the packages and the value of a piece of equipment is largely dependent upon the amount of work he accomplishes with it. I believe it to be one of the first considerations of the shop to give this man service and to keep him satisfied.

For bench mechanics I prefer men who have had several years' experience in general repair shops but who have specialized for a good share of their time on the particular make of truck we are operating. It is well to have at least one top-notch machinist, preferably a tool maker with universal experience, on the staff of automobile mechanics.

In the body and blacksmith shops I prefer men of middle age who have been brought up in the old wagon shops and who are actually wrapped up in their work; men who take pride in the trade. Selection of competent men and placing them where they work to the best advantage is the first step in reducing or holding down costs. Low wages do not mean low costs.

Quite a few vehicles of this type, formerly belonging to the Eleto Company, (succeeded by United Parcel Service) are still in service. In fact several of them have just been completely rebuilt in the Company's shops, in preparation for peak delivery service requirements this winter.



Before anything can be done in the way of maintenance, we must have a place in which to work. The cleaner and more orderly the shop is (such as this one), the better will be the attitude of the men and the quality of work turned out.

The next item I will discuss is proper tools and equipment. *I believe in buying any special small tool which is offered by the specialty salesmen if it promises to save the time of mechanics, or enables them to do a job with less damage to parts than is possible with ordinary tools.*

Recently there have been a larger number than usual of interesting tools and appliances offered. Some of these have been added to our tool room stock, notably, a universal valve lifter and spring compressor and a small combination outfit for servicing batteries.

The valve servicing tool handles valves quickly on any make of truck by the use of various types of jaws, although the whole outfit goes into a small box 6 inches wide and costs only a few dollars.

The battery outfit pulls terminals with ease and opens or closes the ends as necessary. Also, cleans posts and terminals quickly. Other small special tools in our stock are as follows: Spark plug tester; crank-pin turning tool; inside and outside micrometers; five electric drills, two cylinder gauges; key making machine; wheel aligner; brake lining cutter; tube vulcanizer. There are of course a lot of other general garage tools, common to all shops, and too numerous to mention here. All of these tools are time-tried and do their part in helping us to keep our maintenance costs down.

Before investing in a large piece of equipment, however good, we must be sure that we have work enough to do to keep it busy. If an expensive piece of equipment will not effect enough of a saving to pay for itself in from one to two years, we believe it to be more economical to send this class of work out.

We have recently added to our large equipment a complete outfit for boring cylinder blocks and renewing or reconditioning valve seats. We have reached a point where we believe we can justify this

(*Please turn to page* 12)

NO CORROSION*

is one reason DU PONT ANTI-FREEZE METHANOL can SAVE YOUR MOTORS— SAVE YOUR MONEY

● Six other reasons why du Pont Anti-Freeze Methanol is the practical and economical anti-freeze for your fleet are:

1—It is economical to buy and use.

2—It does not readily boil off.

3—It has no unpleasant odor.

4—It gives complete radiator protection at low cost.

5—It maintains cooling plant efficiency.

6—It is colored purple for your protection and identification.

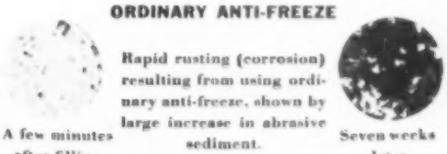
DU PONT
REG U.S. PAT OFF

ANTI-FREEZE METHANOL

*HERE'S PROOF THAT Du Pont Anti-Freeze Methanol Does Not Corrode Radiators

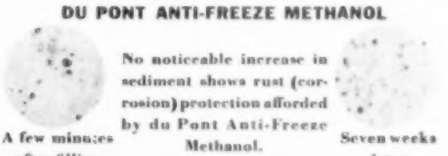
These photomicrographs show the results of a seven-week test of the corrosive action on engines and radiators of widely sold, low-priced anti-freezes compared with du Pont Anti-Freeze Methanol.

ORDINARY ANTI-FREEZE



A few minutes after filling — Rapid rusting (corrosion) resulting from using ordinary anti-freeze, shown by large increase in abrasive sediment. — Seven weeks later

DU PONT ANTI-FREEZE METHANOL



A few minutes after filling — No noticeable increase in sediment shows rust (corrosion) protection afforded by du Pont Anti-Freeze Methanol. — Seven weeks later

SEE YOUR DEALER FOR PRICE AND FURTHER DETAILS, OR MAIL COUPON

E. I. DU PONT DE NEMOURS & CO., Inc., Ammonia Dept., Wilmington, Delaware

Gentlemen: Please send me prices and information on du Pont Anti-Freeze Methanol immediately.

Name_____ Address_____

City_____ State_____

A "HOW-THEY-DO-IT" ARTICLE (*Continued*)

Permanent type of anti-freeze is used by United Parcel Service's modern equipment, in spite of the fact that routes are continuous and there is a minimum of outside parking because loading is done inside.

investment, as we will recondition at least 100 cylinder blocks during the coming year. With an average saving of approximately $6.00 a block, it will no doubt be a factor in reducing our maintenance cost. It will also be a great convenience in that it eliminates the bother of sending the work to outside shops.

By the way, this machine does extremely accurate work and in addition can be set up and centered in the cylinder bore or on the valve seat in an unbelievably short time. We find that our machinist can set up the machine and rebore a G.K. White block in about an hour. He can install new valve seats and reface the valves in about 2½ hours. While the machine is cutting he can do other work on the motor.

Other large equipment in our chassis repair shop consists of the following: Two brake relining machines; a 35-ton hydraulic press; two crane hoists; a 16-inch lathe with necessary attachments; a valve refacing machine; a connecting-rod reboring machine; a crank-pin cutter; five engine stands; three special benches for motor work; one drill press and several tool grinders. Again, these are only the most important ones.

We have a full equipped body repair shop. I feel that it is in the body shop that the greatest savings are made. There is no question in my mind but that it pays to do all body repair work in our own plant, including trimming. The building of new bodies is a different matter, however. Although we are equipped to build complete bodies I do not believe we can compete in this work with the regular production shop independently owned. It is my opinion that any large scale body building should be contracted to outside shops equipped to operate on a production basis.

The large equipment in our body shop consists of the following machines: One jointer; one combination machine for woodwork; one vertical shaper; one band saw; one electric glue pot and one sawfiling bench. So much for the large shop equipment.

As for small tools, we have a power tin-snip which is an extremely useful tool and has paid for itself many times over. A power driven screw-driver is also a time saver. Three electric drills complete our list of small power tools in the body shop.

I might add here that special tools are no good unless the men use them. It sometimes takes a lot of effort and close watching to get men to use to advantage new labor saving tools. But they must be made to see the light and use the special equipment provided wherever it will speed up the work. Men who are averse to giving new tools a fair trial are not desirable employees for a shop which is trying to turn out work quickly and they should be weeded out as soon as possible.

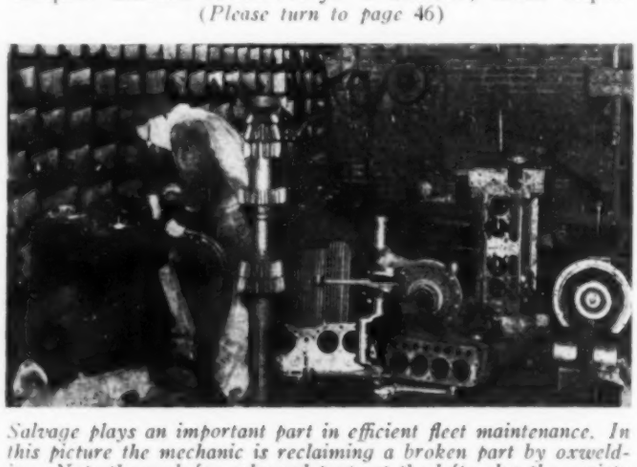
A properly manned and equipped blacksmith shop is a profitable adjunct to the fleet maintenance shop. A first class welder is a prime necessity. There is no use in having an expensively equipped shop unless the men in it can use the facilities to the best advantage.

In addition to straightening and welding broken frames, welding crank cases and cylinder blocks and doing all other routine work which goes with the maintenance of truck bodies and chassis, we salvage innumerable small parts. All the worn, small parts which can be salvaged profitably are brought to the blacksmith shop. The welder works on them whenever he has a little time to spare. When the welding or brazing is done, the parts are piled under the lathe in the chassis repair shop and the machinist works on them during any spare time he may have.

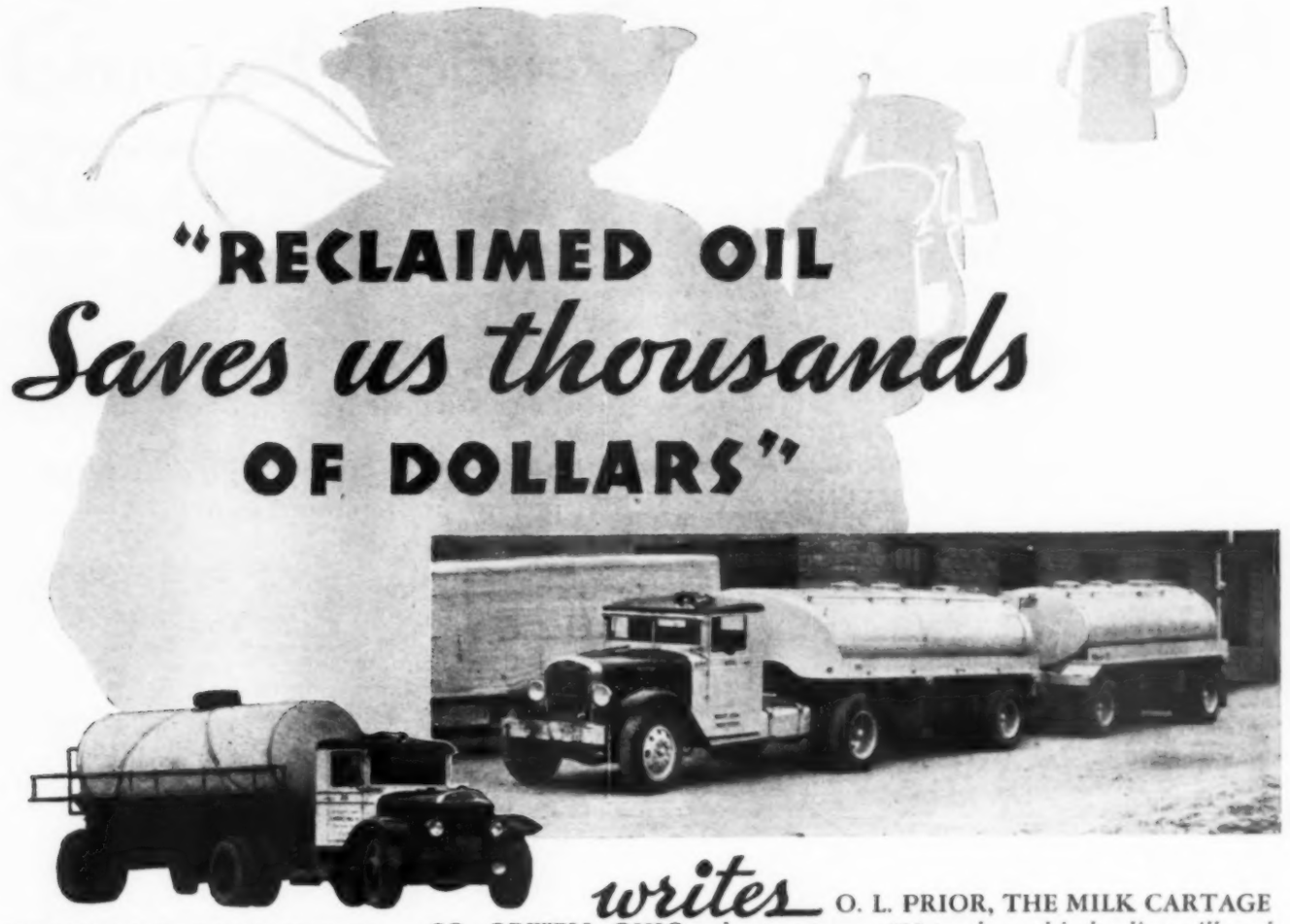
By utilizing this time which might otherwise be lost, the labor cost is small and many dollars worth of parts are saved. Equipment in the blacksmith shop consists of a forge, drill press, small punch, hand operated shear, welding equipment and riveting guns.

In our New York paint shop, we have made considerable progress in cost reduction this year. We are turning out jobs at least 20 per cent faster than formerly and they look better. Most of this improvement is due to the use of one of the new synthetic varnishes recently placed on the market. This material covers well and dries quickly. In our New York shop we are unable to use lacquer on account of fire regulations. In our Los Angeles shop we use lacquer almost exclusively. I believe, from exper-

(*Please turn to page* 46)



Salvage plays an important part in efficient fleet maintenance. In this picture the mechanic is reclaiming a broken part by oxwelding. Note the rack for salvaged parts at the left; also the variety of parts at the right.



"RECLAIMED OIL *Saves us thousands* OF DOLLARS"

writes O. L. PRIOR, THE MILK CARTAGE CO., ORWELL, OHIO, *who operate over 100 trucks used in hauling milk and gasoline. These units make from 50,000 to 250,000 miles per year per unit. They also have a number of gasoline truck trains consisting of tractors, semi-tractors and 4-wheel trailers with a maximum gross load of 65,000 lbs. per truck train.*

"SPEED AND HEAVY LOADS CAUSE motors to generate excessive heat and for this reason we hesitated putting in your Skinner Oil Reclaimer machine. We have now used two of your machines three years. We had considerable difficulty in overcoming the prejudice of mechanics on account of color. We have had our reclaimed oil analyzed at least 10 times during the three years by different laboratories and by truck manufacturers and have found our oil was thoroughly reclaimed. We have had no bad effects from the use of this oil and feel that is has saved us many thousands of dollars. We have also found that this machine cannot make good oil out of a new oil of poor quality, and for that reason we buy the best oil obtainable. To show you that we have had proper results, we need but point out that most of our trucks run 60,000 to 100,000 miles before we even drop the pan to take up bearings." *Signed* O. L. Prior, The Milk Cartage Co.

While you're thinking about it, use the handy coupon below and promptly get, without any obligation, complete facts that will show you exactly what a Skinner in your own garage can save you.

SKINNER MOTORS, INC., PIONEERS IN OIL RECLAMATION, 2229 DALZELLE AT 14th ST., DETROIT, MICH.

PUT A STOP TO DAILY WASTE OF OIL AND HARD EARNED CASH in the operation of your own fleet as these and hundreds of other fleet owners are doing. Read these excerpts from dozens of letters in our files. Names on request.

•

from a MOTOR COACH CO. *in Tennessee*—
"Before installing a Skinner, we were using 1000 gallons of oil every 30 days. We cut our oil consumption to about 100 gallons and added 5 new coaches to our fleet."

from a NEWSPAPER PUBLISHING CO. *in Massachusetts*—
"Our entire fleet operates on recalimed oil. We have found by tests that the oil is just as good as new oil. Therefore, we do not hesitate to highly recommend a Skinner to any fleet operator."

from a TRANSPORTATION CO. *in Oklahoma*—
"The performance of the Skinner has been a revelation—there was no one more skeptical about it before we gave it a thorough trial. Closely kept records indicate we are reclaiming oil for about 12c per gallon. Tests show the oil reclaimed is satisfactory in every respect."

from an AVIATION TRANSPORT CO. *in Ohio*—
"Practically any operator can effect economies with a Skinner. Exhaustive tests have been run on this reclaimed oil and we are safe in saying that results obtained are as good as original oil."

•

HERE'S THE MACHINE THAT'S reducing oil bills for hundreds of prominent operators of all types of fleets—40% to 60%. Skinner Reclaimers (Listed by the Underwriters' Laboratories) are priced as low as $290. There's a size to meet your particular operating needs. Get the facts and figures about this dollar-and-oil saving equipment. No obligation—mail coupon today.

SKINNER OIL RECLAIMERS

Mail this coupon

WITH YOUR BUSINESS LETTERHEAD

SKINNER MOTORS, INC., Pioneers in Oil Reclamation,
2229 Dalzelle at 14th St., Detroit, Mich.

Please send us, without obligation, complete information about Skinner Oil Reclaimers. Also tell us definitely with facts and dollar-and-cents figures what a Skinner Reclaimer will save us in cash and oil.

We purchase approx.....gallons of oil per month.

We drain approx.....gallons of oil per month.

We pay.....per gallon of oil.

Our electric current rate is.....c per kilowatt hour.

Signed.....Position..... 11—32

Say "I saw it in FLEET OWNER"—It Helps!

More *about* Self vs. Outside Maintenance

By L. V. Newton

Bylleshy Engineering & Management Corp., Chicago, Ill.

An Operator Comments on This Important and Timely Subject After Reading Henry V. Middleworth's Article in Our September Issue

THE recurrent question of self vs. service station maintenance is at all times somewhat controversial, and the writer was very much interested in reading Mr. Middleworth's article entitled "Self Maintenance Vs. Farming Out" which appeared in the September issue of FLEET OWNER.

The field naturally divides itself into three groups, namely, those who are thoroughly sold on self maintenance; those who are similarly sold on service station maintenance; and those who prefer a combination of the two.

Each feels that his plan is productive of the least expensive and most satisfactory results, and possibly this is true, fleet complexions, densities of service, and operating requirements being taken into consideration. My beliefs on this subject are as follows:

Operators of small fleets up to 25 to 30 vehicles cannot afford to make provision for *complete* self-maintenance. Minor repairs and daily service work *should* be done by this type of fleet owner. Major overhauling, painting, body repair work, and other specialized work should be done outside.

Practically no repair parts stock should be carried, rather should the fleet owner depend upon the manufacturers, jobbers, dealers' service stations and other sources of supply for his repair parts stock.

Operators of intermediate sized fleets of from 30 to 100 vehicles, if same are concentrated, will be warranted to make a modest investment in shop equipment, together with adequate repair shop space and personnel.

Repair parts stocks should be held to a minimum, the operator again depending upon the manufacturer, jobber and dealer to carry stock for him. Generally speaking, attempts should not be made by the intermediate-sized fleet owner to perform within his own shop all classes of work, as it will usually be found that certain specialized work can be performed by outside agencies at lower costs.

If the fleet is scattered, it should be treated as a small fleet, and dependence placed upon outside agencies for major repair work and certain specialized work.

Operators of large, concentrated fleets of 100 vehicles or more, are warranted in performing more work within their own shops. Again, however, it may be found, upon making a study of the cost of doing certain specialized work, that same may be done more economically by outside agencies. If the large fleet is scattered, it should be treated as a small or intermediate fleet, as the case may warrant.

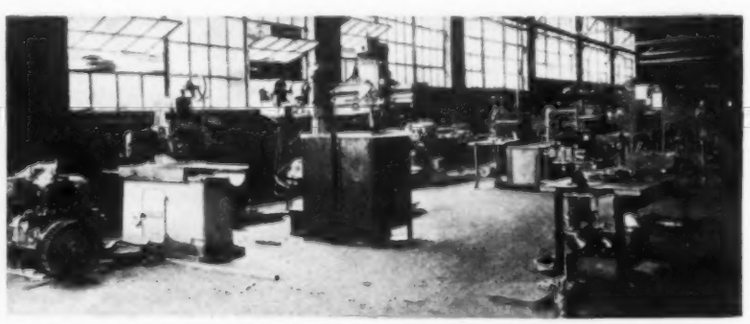
The fleet owner, in attempting to arrive at a decision as to which plan he will follow, must know what his total cost per hour for work in his own shop will be. Extreme caution should be exercised to be certain that in computing this cost, cognizance is taken of all proper overhead charges.

The adequacy and ability of the outside service stations should also be considered. Just as standards of efficiency vary between fleets, so do they vary in the ability of outside plants to render competent service at costs that are competitive with the fleet owner's ability to do this work himself.

With all things equal, I feel safe in saying that the majority of fleet owners will favor self-maintenance, and the outside agencies must therefore offer sizeable advantages before expecting a share of this business. It appears that the manufacturer or dealer must improve the character of his service, must better understand the fleet owner's problems and must attune his service organization to care properly for the fleet owner's work, before a decided swing (if ever) may be expected away from self-maintenance.

About a year and a half ago, the Transportation and Maintenance Committee of the Society of Automotive Engineers made a careful survey of this subject. Operators of 67 fleets containing 18,430 trucks and 11,073 passenger cars, developing 347,000,000 miles per year, described their maintenance policies and methods. Data was also collected from 118 factory branches and dealers.

(Please turn to p. 46)



Machine shop and unit overhaul department of a large fleet. A moderate investment in shop equipment is warranted where the fleet is sufficiently centralized and is of a fairly large size.

CHICAGO GOVERNORS

CHICAGO *Mono-Seal*

LIST PRICE $12.50

write for discounts

A single seal prevents change of set or removal of governor — TAMPER-PROOF *in fact.*

CHICAGO *Locksit*

LIST PRICE $13.50

write for discounts

Key Controlled AND can be sealed *thru lock,* making duplicate keys or lock picking instruments ineffective—TAMPER-PROOF *in fact.*

*Save**

25% Gasoline

40% Oil

40% Repairs

45% Tires

Eliminate the cause of of all accidents 65%

* *Percentages are based on savings effected for average fleet*

NOTE: Seals on all CHICAGO GOVERNORS not only guard adjustment but also prevent removal of governor from manifold.

PATENT NOTICE

Improved features of CHICAGO GOVERNORS are fully protected by patents—August 26, 1924 (1506588); September 20, 1932 (1878721) and other patents pending.

Unconditionally Guaranteed

ALL CHICAGO GOVERNORS are guaranteed to control both engine and driving speeds under all loads, for the life of the engine.

* * ***Try This***—CHICAGO GOVERNORS are built for road as well as laboratory performance. That you may *know* exactly what they can save *you* on *your* fleet, operating under *your* everyday working conditions, we request permission to send one for 30-DAY FREE TEST on one of *your* trucks (cars, buses). Indicate make and model on coupon, pin it to your letterhead. If after 30 days you do not find our claims substantially true in your case, send the governor back.

CHICAGO GOVERNOR & MFG. CO.
505 South Laflin St., CHICAGO, U. S. A.

30-DAY FREE TEST COUPON

Send us a Mono-Seal ☐ Locksit ☐ Governor for

.....

(Make and Model) .....
for 30-day Free Test. It is understood that this obligates us in no way.

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Say "I saw it in FLEET OWNER"—It Helps!

By Sidney J. Beer

"Straight Line" Methods Reduce Costs

How the Keystone Express System of Los Angeles Has Successfully Reduced Operating Expenses by the "Direct Line Production" Method

STATISTICIANS claim that approxmately 30 cents out of every dollar spent in motor freight operation goes for maintenance. It is generally agreed that this is the biggest item of expense on the books.

With this in mind, J. Nelson Kagarise, vice president and general manager of the Keystone Express System, operating one of the largest truck companies in the southwest and serving all of the major cities of southern California, has successfully reduced his operating expenses in all departments of the organization by employing the "direct line production method."

This method has been in use for the past two years. The following is a brief resume of the operation.

In the freight transportation business, the source of all information is the bill of lading. This is treated as the "raw material" and is the first step in the accounting procedure. All subsequent operations are treated as "work in process" and are placed so that each operation succeeds the one just completed.

The last step of the in line method is the financial statement, known as the "finished product."

The office desks are arranged in the following manner: dispatcher's office, billing department, cashier, record clerk, accounts receivable bookkeeper, general ledger bookkeeper and office manager.

These desks are arranged one behind the other so that the work flows in a ribbon-like manner until the finished product has been achieved.

Each member of the office is reminded that only one thing can be done properly at a time. Also that there are just three things to each job: GET READY—DO IT—CLEAN UP. Keeping these three things subconsciously in mind, the office personnel is able to complete more jobs and, incidentally, more work per day with less effort.

The office work is not taken en masse, but rather each job is studied separately. The jobs are assigned to the various members of the office with the "straight line" method always in mind.

Adoption of this "straight line" method has resulted in a decrease of 25 per cent in office personnel and in eliminating overtime completely. At the same time, a marked improvement has been made in the completed records and reports.

It is quite generally understood that operating costs of the Keystone Express System are among the lowest in the country. Strict adherence to the following maintenance routine has greatly helped to bring about this condition.

The five rules in operating are strictly observed:

1. Regular and frequent oil change and complete greasing for all equipment.
2. Daily inspection of equipment before going on the road, by drivers and superintendents.
3. Immediate attention to minor repairs and substitution of a relief truck if necessary before allowing one in need of repair to go on the road.

(Please turn to page 46)

Hold That Pose!

THERE'S unusual maintenance activity in the Keystone Express System's shops, unless an overzealous photographer raged rampant in his desire for action.

In all seriousness, however, this picture bears out the Company's claim of "Immediate attention to minor repairs before allowing a truck to go out on the road."

The appearance factor, too, is not being overlooked, as the chap on the ladder would have us believe.

"Hold 'Em Down, Mister!"

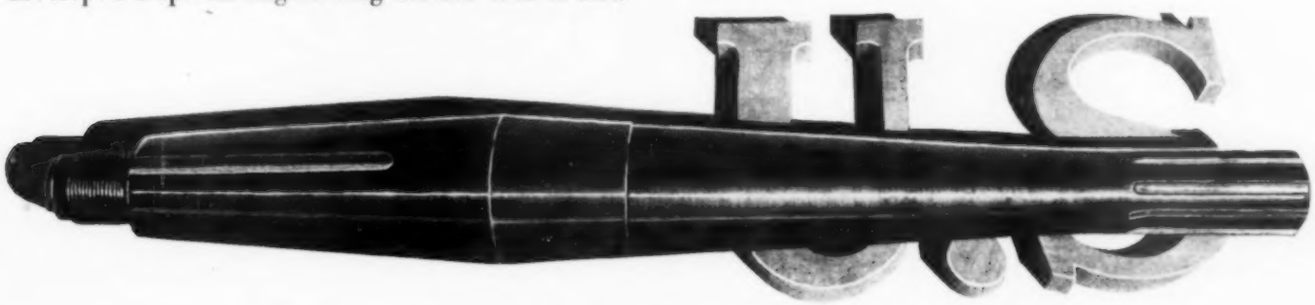
Maintenance costs are still too high. Operators of buses, trucks and taxi-cabs must hold down their maintenance expenditures if they are to show a profit. This advertisement is to point out to these men one way in which these costs can be cut.

Axle shaft maintenance, involving the cost of new shafts, labor, damage to other parts, pull-ins, lost earning power, and lost good-will, runs into sizable figures on most operations. Reduction of axle shaft breakage will bring you real savings.

For many years this company has devoted special effort toward helping bus, truck and taxi-cab operators cut down axle shaft failure, under all sorts of conditions. The development of the country's outstanding line of heavy duty shafts has gone far in accomplishing this end. But many operators were faced with unusual conditions that required individual study. So we have developed a special engineering service that is now available to any responsible operator, without charge.

Whatever your conditions or whatever your problems, as far as axle shafts are concerned, the service of this company is the surest and quickest way to reduce your maintenance costs to the lowest possible level. We eagerly await the opportunity of proving this to you. Won't you get in touch with us promptly? THE U. S. AXLE COMPANY, INC., POTTSTOWN, PA.

Prompt delivery of U. S. Axle shafts through over 400 jobbers throughout the country. Backed by factory warehouse stocks at Atlanta; Boston; Chicago; Detroit; New York; Pittsburgh; San Francisco; Acton, Ontario.



Say "I saw it in FLEET OWNER"—It Helps!

How to Train Your Driver Personnel

By L. J. Mathot
(Safety Engineer)

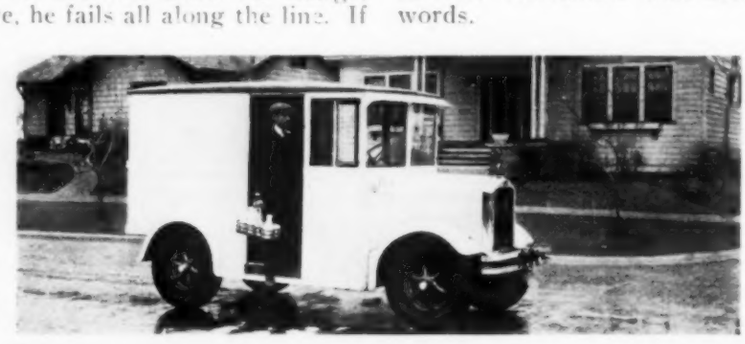
Safety Engineer Outlines the Duties of a Fleet Supervisor and Gives Thirteen Rules for Selecting and Training Driver Personnel

WHEN we consider that automobile accidents are causing over 33,000 fatalities each year, and are causing 1,000,000 annual injuries, with an economic loss of over $1,250,000,000 per year, (more than one-half the cost of our public school system, and three times the fire losses of the country,) there is little wonder that people throughout the United States generally are taking a greater interest in combatting this monster which has steadily been getting stronger and more destructive each year.

It is entirely within our control to a very considerable extent to reduce this horrible toll of accidents and with those who are in charge of truck fleets, rests a very great responsibility. You must of course, be capable of many important duties; for instance, you must be a good judge of human nature; a good judge of drivers; know truck equipment; be capable of putting your instructions across; know the various territories in which your goods are delivered; you must be a good dispatcher; enthusiastic in safety; be fair; impartial; capable of maintaining discipline and holding the respect of your men; you must be a hard worker; for to you is entrusted the care in many cases of several hundreds of thousands of dollars in truck and delivery equipment.

You must also attend to many complaints, and you must be a good manager to the end that the delivery end of the business will operate at the lowest possible cost. All of these capabilities you must possess, and all of these duties you must fulfill, but none of these duties need interfere with your making a creditable showing in accident prevention.

The fleet supervisor must be big enough to control the accident situation for the fleet under his charge, because if he fails here, he fails all along the line. If he fails in safety, he fails on deliveries, fails to satisfy customers, fails on low cost of deliveries, fails on low cost of upkeep of equipment. He fails in discipline, fails in holding the respect of his men, and last but not least, it means a state of disorganization in one of the most vital legs of the business.



Whether it's milk, packages or concrete that you're delivering, this advice on driver training should be found valuable to you and your organization. —Editor.

A truck fleet supervisor for a large department store once told me this: "I am a new man on this job, and it is my most earnest desire to make a good showing 'Safetywise' because I fully realize that if I am able to control the accident situation, my job will be made easier, and it will be no trouble at all for me to hold on to this job."

This man, to my mind, realized what we should all know, that accident prevention means trouble prevention, disorganization prevention, excessive cost prevention, etc. This, I believe is generally known among fleet owners and supervisors, and that no further argument need be offered in favor of it, and I only mention the matter to again emphasize the seriousness of becoming lax on safety even to the smallest degree.

If I were to lay down certain specific rules to a fleet supervisor, I would not forget to mention the following:

1.—Train your own drivers from your present crew of delivery men.

2—If you must hire drivers from outside your own organization leave no stone unturned to make certain that you are not making a mistake before actually employing the driver.

3—Make it a duty to discover the weaknesses of each driver in your employ; living habits included.

4—Do everything in your power to make a better driver out of a good driver, and a good driver out of one not so good.

5—Work hard and sweat for the sake of "safety" and it won't be long until all of your men will fall in line. Remember that actions speak louder than words.

6—Put yourself about, and observe your men driving in the cities and rural districts. You will learn more in this way than by any other method.

7—Never consider that too much "safety" is being preached. This is one thing we cannot get too much of.

(Continued on p. 46)

AMERICAN BRAKEBLOK

In Rolls, Full-Coverage Sets
Keeper Type and Bolt-On Full-Coverage Sets

American Brakeblok is supplied for *any* type of installation—for light trucks and commercial vehicles and for the largest trucks and buses. It is available in Rolls, Full-Coverage Sets, Keeper Type and Bolt-On Full-Coverage Type. (New low prices now in effect on American Brakeblok in sets for Plymouth, Chevrolet and Ford.)

Results are uniform in all types of American Brakeblok installations. This new-type safety brake lining gives quicker, smoother stops under all conditions. It makes definite reductions in operating and maintenance costs, because it wears longer and requires fewer adjustments than ordinary brake linings. Mile for mile and stop for stop, American Brakeblok will give you more for your money than any lining you have ever used.

American Brakeblok is utterly different in character as well as performance. It is a dense, homogeneous, non-metallic solid, containing no rubber. It is formed under pressure, heat-treated and accurately ground to size. It does not stiffen or deteriorate either from age or service.

Write for complete information on any type of installation in which you are interested.

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AMERICAN BRAKEBLOK

Say "I saw it in FLEET OWNER"—It Helps!

TOM AND JERRY — *When the going is Tough*

"FREEPORT FOUNDRY JUST PHONED, TOM— WANT THESE CASTINGS DELIVERED BY NOON. CAN YOU MAKE IT OVER THAT TOUGH DETOUR ON ROUTE SEVEN?"
"I'LL DO MY BEST, BOSS"
"O.K. TOM, GO TO IT. THIS IS OUR CHANCE TO GET IN ON SOME MIGHTY NICE BUSINESS"
"BOY—THIS AIN'T A ROAD, IT'S A SWAMP. LOOK AT THAT LINE OF CARS. WELL, HERE GOES"
ROAD CLO
TRAVEL AT YOUR OWN RISK
"HELLO, HERE ALREADY? I HEARD NOBODY WAS GETTING THROUGH ON 'SEVEN' THIS MORNING"
"YEH, SEVERAL OF THE GUYS WERE AFRAID TO RISK IT. THANKS TO THESE TRUCK TIRES I PULLED THROUGH, THOUGH"
"H'M WHAT KIND ARE THEY?
FREEPORT FOUNDRY
"GOODRICH— GOODRICH HEAVY DUTY EXPRESS BALLOONS"
Goodrich Silvertown

Say "I saw it in FLEET OWNER"—It Helps!

GOODRICH has developed a superior tire for every transportation need. When the going is tough there's no better bet than the new Goodrich Heavy Duty Express Balloon. Its tougher, 15% deeper, wider tread is specially designed to give positive sure-footed traction to trucks operating on unimproved roads, or where there are no roads at all.

The additional mileage, increased cushion, improved traction and safety made available in Goodrich Tires can mean lower trucking costs — increased trucking efficiency for *you*.

Get the facts from your nearest Goodrich Distributor. Phone him now. Look under "Tires" in the Classified Directory.

The B. F. Goodrich Rubber Company, Est. 1870, Akron, Ohio. Pacific Goodrich Rubber Co., Los Angeles, Cal. In Canada: Canadian Goodrich Co., Ltd., Kitchener, Ont. The International B. F. Goodrich Corp. (Export).

On your trucks they bring these POSITIVE SAVINGS

Increased mileage . . .
Lower tire costs per mile . . .
Fewer blow-outs — delays . . .
Higher speeds . . .
Fewer truck repairs . . .
Fewer tire repairs . . .
Better traction-braking . . .
Added safety . . .
More trips per day . . .
Improved comfort of drivers.

Goodrich *Truck* Balloons

Another B. F. Goodrich *Product*

32,000 Rubber Articles · Goodrich Silvertowns · Zippers · Rubber Footwear
Drug Sundries · Soles · Heels · Hose · Belting · Packing · Molded Goods

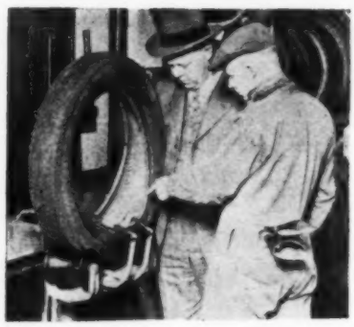
Be a Transportation Expert

Learn more about tires — it's a sure way to save money — big money. Get the especially prepared Goodrich Booklet which is full of truck-tire facts that you can put to immediate use. Tear this out — write your name and address on the border, and mail to the Truck & Bus Tire Department, The B. F. Goodrich Rubber Company, Akron, Ohio.

Say "I saw it in FLEET OWNER"—It Helps!

How to Increase Tire Mileage

In Which Is Discussed the Relation of Road Surfaces to Tire Wear — Correct Inflation is Also Important Factor



By E. K. Smith

HOW well we remember, not many years ago, when ten to twelve thousand miles was exceptional service to be gotten out of tires and when blow-outs, punctures and roadside patches were an almost weekly occurrence.

Now, in the days of balloon tires and smooth, paved roads, 20 to 30 thousand miles represents the minimum service we expect from our tires, and roadside repairs come so infrequently that we get out of practice between times. Nevertheless recent tests demonstrate that very little more care on the part of the fleet operator will enable him to get much more service out of his tires.

Most operators know the importance of maintaining air pressure in their tires even though some may be careless about checking it. We recognize, of course, that under-inflated tires cause excessive bending of the side walls and pinching of the tubes and fabric when passing over a road obstruction.

Tests reported to the Highway Research Board last December carry these studies still further. The standard pressure recommended for tires of a given size is based of course on the average load for the car on which they are used. If a greater load is applied, the tire is flattened slightly and excessive wear is noticed on the outer beads of the tread, but not on the center.

Vehicle used by U. S. Bureau of Public Roads for making impact tests described in this article. An illustrated graph of these tests appeared in our May issue on page 16.—Editor.

Many operators have noticed this peculiar wear on tires which they felt were kept fully inflated at all times. The explanation is that a few pounds more air was necessary to take care of the extra load on the tire. On the other hand, where the car is normally driven with a much lighter load than standard, there is not enough load to flatten out the tire. This leaves something less than the correct width of tread in contact with the roadway. The result is excessive wear showing in the center of the tire only.

With low pressure tires, normally inflated with 35 pounds of pressure, a difference in pressure of only 7 pounds represents a difference of 20 per cent in the inflation. The tests just mentioned also showed the considerable difference in pressure that may be developed during one day. The desired pressure early in the morning may become several pounds higher by noon if the atmosphere becomes hot.

Fleet owners readily recognize that a very rough road surface is hard on both the car and the tires. With the improvement of roads, the old-fashioned stone bruise is not so common as it used to be. But tires can still receive abuse on a modern highway. Lack of proper maintenance often allows a road or street surface to acquire humps and hollows that, under the pounding of steady traffic, rapidly get worse.

Tests made by the U. S. Bureau of Public Roads show that even low pressure pneumatic tires exercise a considerable "impact" or pounding on the surface of the road, considerably greater than the actual load of the vehicle on the wheels. The pounding action is, of course, very much the same whether we consider the tire pounding the road or the road pounding the tire.

A few years ago we used to think of impact as being caused mostly by a few heavy trucks passing over some major obstruction in the roadway of rather infrequent occurrence. Today, tests of the U. S. Bureau of Public Roads have shown that besides the "drop" impact, there is another type of impact which may be called "shock impact" that increases rather steadily with the speed of the car.

Thus, tests made on single balloon tires such as used on motor buses show that the blow with which the tire hits the road surface in meeting some irregularity at 40 miles an hour may be three times as great as when driving 5 miles an hour. Naturally, the shock to the body of the tire and the distortion to the casing as a low pressure tire meets and passes over the obstruction are severe.

Improperly repaired trenches on city streets are one of the greatest causes of damage to tires. The sudden drop into a hole in the pavement and the shock as the tire strikes the farther edge may weaken a tire so that its life is considerably reduced.

For his own sake the operator should insist that curbs along city streets be sloped back from the gutter line instead of rising straight up. Putting a "batter," as it is called, of only an inch or two in the face of the curb saves the operator from grinding off the thin sides of his tires when he drives close to the curb in parking.

Vehicle operators everywhere are thoroughly justified

(*Please turn to page* 42)

A plain statement of facts concerning ANTI-FREEZE

Important Information for the Protection of Car Owners

IN AN EFFORT TO CLEAR UP the confusion regarding anti-freeze, which appears to exist in the minds of many consumers, we give below the outstanding facts. The following statements are guaranteed to be correct and accurate in every particular. They are supported by the highest scientific authorities.

THE problem of preventing freezing in the cooling-systems of automobiles during the cold weather months was one that taxed the ingenuity of car owners for many years. Salt, honey, alcohol, kerosene, glycerine and many other products and by-products were used with varying success. Within the past few years, however, there has been developed a new product, a product specially designed for this one use and purpose.

That product is Eveready Prestone. It is not a general commodity used principally for other purposes: it is an anti-freeze, and nothing else. It is a scientific development, thoroughly approved by all car manufacturers; a product which embodies all the advantages of all materials previously used, with none of their inherent weaknesses.

In developing Eveready Prestone, the laboratories of Union Carbide and Carbon Corporation, keeping in mind the requirements of the U. S. Bureau of Standards for an ideal anti-freeze, worked toward a product which would satisfy the following specifications:

1. **It must not boil away.** A boil-away anti-freeze is both an inconvenience and a poor protector against sudden changes in the weather. Such anti-freeze requires frequent renewals, and leaves the car unprotected when a cold snap follows warm weather.

2. **It must be harmless to the cooling-system.** An anti-freeze which corrodes the cooling-system is a poor product to put in a car.

3. **It must be effective in preventing freezing.** The effectiveness of the materials commonly used before the advent of Eveready Prestone varied over a wide range. Some were effective in preventing freezing; others were not.

4. **It must not affect the car finish.** The fumes of boil-away products were a source of danger to the finish of fine cars. This was a weakness which those who developed Eveready Prestone were anxious to avoid.

5. **It must circulate freely at the lowest operating temperatures.** A heavy, viscous material, which is not free-flowing, is obviously a poor cooling agent.

6. **It must be non-inflammable and odorless.** Winter driving was often made unpleasant by smelly fumes, while inflammable mixtures held the possibility of causing accidents.

7. **It must not "creep."** Certain materials in common use had a strong tendency to leak out of systems which were tight enough to hold water but not tight enough to hold these materials. The new product, it was felt, must have *less tendency to leak than water.* Consequently, if a car could hold water it would hold the anti-freeze.

8. **It must be packaged as a concentrated product.** Many of the products which the public was using, because of their thick, heavy nature in the concentrated form, were sold as water-diluted solutions. The cost of canning and shipping plain water was thus borne by the public. Obviously, if a concentrated product could be packaged and sold the user could be saved that expense. Furthermore, the public had no way of telling how much of these diluted solutions was anti-freeze material and how much was ordinary water. Some brands contained as much as 55% plain water: others contained less. It was decided, therefore, that the new product must be concentrated. Thus the public could be sure of buying a standard product, always the same and always of known value.

9. **It must be economical.** The laboratories which developed the new product were not interested in low first-cost per gallon. They *were* interested in low cost per season. It was felt that car owners who had been buying boil-away anti-freeze on the installment plan, a few quarts at a time, would not object to a relatively high first-cost if the *all-season* cost were low. The new product, therefore, was priced to cost, for an average winter season, no more than the cost of boil-away anti-freeze.

Thus was developed Eveready Prestone, the only anti-freeze which meets *all* these requirements. But laboratory effort did not stop with that.

A NEW AND IMPROVED PRODUCT AT A LOWER PRICE

Further research developed the product to a point where it gave protection, not only against freezing but also against rust and corrosion in the cooling-system. And such is the *new* Eveready Prestone. Its use reduces the corrosive action of water on the metals of the cooling-system as follows: brass, copper, solder, aluminum and zinc, 75%; cast iron, 95%. No other "treated" anti-freeze compares with Eveready Prestone for the prevention of rust and corrosion.

The new Eveready Prestone has been reduced in price. It now offers by far the safest and most economical protection against both freezing and corrosion. The car owner who uses Eveready Prestone is assured of complete protection through all weather changes, freedom from worry and the trouble of replacements, and a clean, rust-free radiator. He insures his car, not only against a freeze-up, but also against the costly repairs that follow a rust-clogged and corroded cooling-system. He prolongs the life of his car.

National Carbon Company, Inc., Unit of Union Carbide and Carbon Corporation, New York, N. Y.

Tank Truck "Faws Down" *but* "No Boom!"

Light-Weight, All-Aluminum, Welded Tank, Mounted on Truck, Rolls Down Embankment Without Rupturing Welds

WHEN a new material is introduced, there is always some doubt expressed as to its suitability for a given purpose. Aluminum was no exception to this rule, and in the early development of aluminum truck bodies and truck tanks, the question was often raised as to whether this light metal was strong enough to stand the gaff of severe haulage service.

But the practicability and durability of aluminum for truck bodies have been well demonstrated, and today, aluminum is commonly employed in the construction of the bodies of coal trucks, sand and gravel trucks and trucks doing franchise hauling.

Bakeries, dairies, wholesale and retail grocers, packing houses, furniture stores, department stores, and the like, have also found in this metal a material which will reduce the dead weight of the trucks and improve their operating performance.

Before the adoption of the light, strong alloys of aluminum for truck tanks, a good many tests were conducted to determine whether the aluminum tank would be leakproof in case of a collision or wreck. It was thought by some that the welds might not hold under such circumstances, but again aluminum has proved its worth and is now a commonly accepted material for truck tank construction.

Recently, aluminum was given an actual wreck test in California when a transport assembly consisting of a tank truck with an aluminum tank and a trailer with a steel tank went over an embankment. The unit was operated by Charles Kuppinger, a contract hauler.

The truck, carrying 3,000 gallons of gasoline, and the trailer, carrying 3,800 gallons, rolled down a 20-foot embankment. The trailer broke loose on the first turnover and jammed into the rear of the aluminum truck tank, caving it in but without breaking the welds.

After rolling over twice, the truck came to rest on its wheels at an angle of about 25°, with the trailer a few feet farther down the hill. The steel tank, in this instance, broke open at the seams and all of the gasoline was lost.

Every weld of the aluminum tank remained intact. The cast aluminum manhole covers, however, were damaged to such an extent that practically all of the gasoline escaped through them. There was not the slightest sign of a crack or break in either the welds or the material itself in the aluminum tank. The steel tank on the trailer was split open at the front end and down the longitudinal seams.

There was no fire, probably because the gasoline from the trailer ran away from the truck engine, and that it escaped from the truck at a slow rate and did not reach the hot spots of the engine or exhaust.

This construction is typical of the fabrication of a great many truck tanks and serves to emphasize the fact that with correct design, proper knowledge of welding, and diligence in following procedure control methods, the oxy-acetylene welding process can be applied to such work with splendid results.

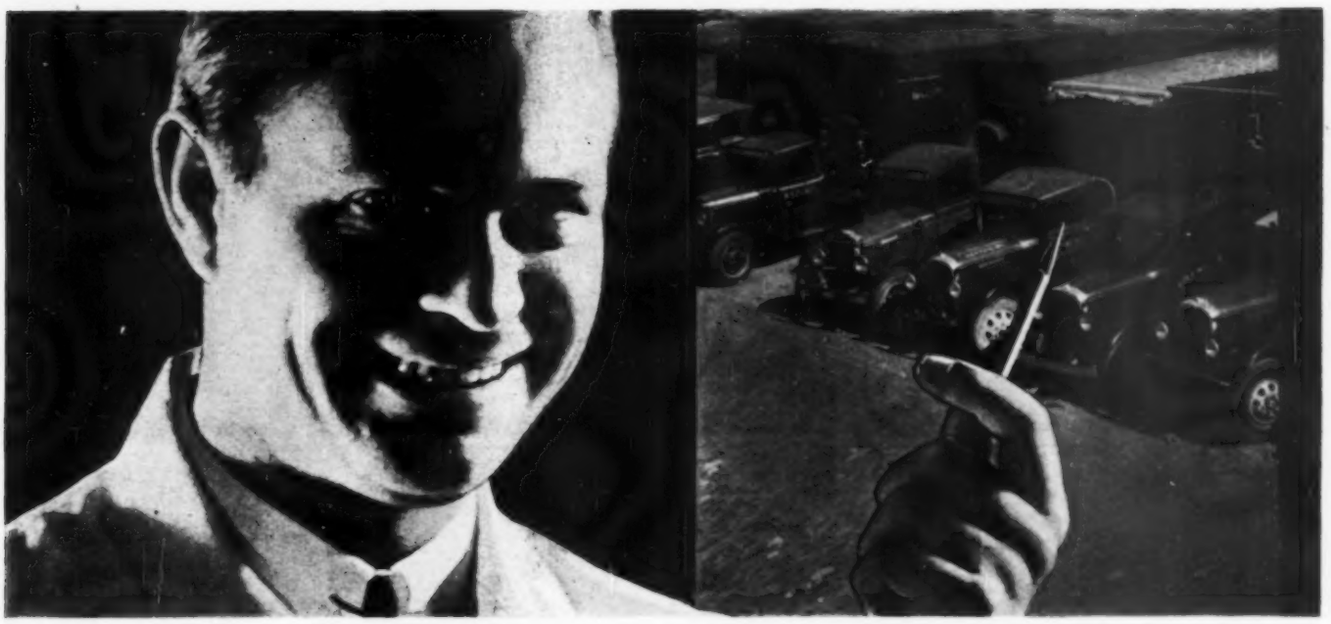
Recent trends in this type of construction can be well demonstrated by the advances in the use of ox-welded aluminum transportation units.

Other branches of the transportation industry are also recognizing the advantages to be obtained through the use of lighter weight units. The reductions in power required to move a given load, as well as the decreased wear and tear on equipment, are all considerations that cannot help but make for more efficient operation.

Not Broke But Badly Bent!

BADLY Dented—But the welds of this 3,000-gallon aluminum truck tank remained intact after a collision, which caused both truck and trailer to roll down a steep embankment.

All of which speaks very highly of the merits of aluminum as a body or tank material—and of the oxwelding process of fabricating this material together.



Yes Sir!

347B DOES DOUBLE DUTY

Fleet owners must get, from ignition cable, dependable day-in day-out service. That's why Packard makes its famous 347B—the Super-Duty cable with multiple resistance.

Solves Two Major Maintenance Problems

IGNITION FAILURE is always serious. Packard 347B is designed to deliver maximum service at all times, under the most severe conditions.

FREQUENT REPLACEMENT is costly. Packard 347B is built to stand up for many more miles of actual service.

To minimize schedule interruptions and expensive replacements caused by weak or faulty ignition—specify Packard 347B . . . Packard Electric Corporation, Warren, Ohio.

Try-ply Protective Sheathing:

1. Lacquered cotton braid
2. Varnished cambric tape
3. Strong braid, multiple "Lac-kard" processed

LIVE WIRES

Have you seen the new all-talkie sensation "Live Wires"? Don't miss it. Put on by an all-star professional cast. Humor. Drama. And a moral that clearly points the way to safer, surer operation and lower maintenance costs. Ask your jobber when it's to be shown in your locality or write us direct.

Packard

REG. U. S. PAT. OFF. TRADE MARK

IGNITION CABLE • BATTERY CABLE • LIGHTING CABLE

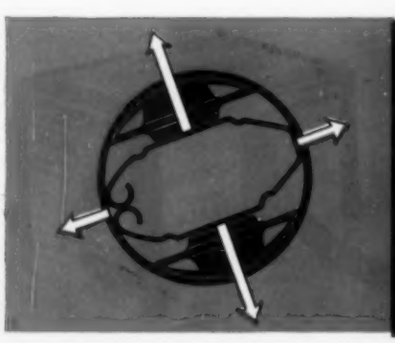
The Standard Wiring Equipment of the Automotive Industry

Say "I saw it in FLEET OWNER"—It Helps!

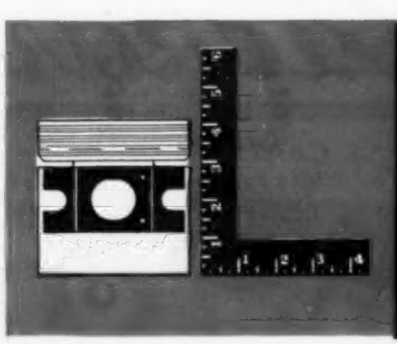
Correct

Correct Expansion attained by scientific application of pressure at **10** different points—indicated by the stars

PATENTS PENDING



CORRECT EXPANSION OVER ENTIRE SKIRT INSURES FULL CYLINDER CONTACT



CORRECT EXPANSION PREVENTS PISTON ROCKING AND "SKIRT-TAPER"

Expansion

Makes Possible this Remarkable Guarantee of

THE PERFECT CIRCLE

Piston Expander

For Ford Model A

TO completely restore a worn or collapsed piston skirt—and stop piston slap—requires scientific construction based on thorough engineering knowledge.

The PERFECT CIRCLE *Piston Expander* was designed by men who have made lifelong studies of cylinder service problems. They tackled the job from a scientific and practical standpoint, determined to produce a device which would actually restore the skirt to the proper diameter and keep it there.

Obviously, the keynote was *correct expansion* of the entire piston skirt. And this was accomplished through the creation of an entirely new type of piston expander.

Note the wide zone covered by the PERFECT CIRCLE *Piston Expander*. Note also the ten points of contact with the skirt. Each point is scientifically located to do its part in producing *correct expansion*.

An installation of PERFECT CIRCLE *Piston Expanders*, and PERFECT CIRCLE rings, is the most economical method of securing a first-class ring and piston job. Install one set and convince yourself.

PERFECT CIRCLE *Piston Expanders* especially designed for Ford Model A are carried by PERFECT CIRCLE jobbers everywhere. List price, 85c each, $3.40 per set of four.

THE PERFECT CIRCLE COMPANY
Hagerstown, Indiana

© 1932

Unconditional Performance Guarantee

PERFECT CIRCLE *Piston Expanders* are unconditionally guaranteed by the manufacturer to stop piston slap and give satisfactory performance (regardless of amount of cylinder wear or piston condition) when installed in conjunction with a *complete new set* of PERFECT CIRCLE *"85" Oil-Regulating* and *Compression* rings. If for any reason the car owner is dissatisfied, the installing dealer is authorized to return the expanders and rings to a PERFECT CIRCLE jobber for replacement or credit.

1 Correct Expansion Over Entire Piston Skirt

2 Piston Slap Eliminated **3** No Machining Necessary

4 Securely Locked in Place by Piston Pin

5 Unconditional Performance Guarantee

CITIES SERVICE PRESENTS "POWER PROVER"

GASOLINE and motor oil are purchased and placed in vehicles for the purpose of "manufacturing" power and miles of transportation, the operator of a fleet of cars, trucks or buses being, in this case, the "manufacturer" of the power, and the degree of his manufacturing efficiency resting entirely within his own responsibility. However, work which has been done in the recent past has indicated that the operator can be assisted to more efficient operation.

With the thought in mind that operators may get the utmost efficiency from fuels and oils, the automotive research division of Cities Service Company has developed their "Power Prover," an instrument which detects unburned or wasted gasoline by analyzing the exhaust gases of a vehicle, thus providing a "yardstick" by which proper adjustments can be made without extensive road testing.

This assistance, when placed at the disposal of the fleet operator, has proven extremely valuable, particularly during these days when rigid economy is the "theme song" in all organizations, and all costs are supposedly being "cut to the bone." Moreover, the report that, through the Power Prover service, a large number of fleets were able to further reduce gasoline consumption and allied costs by another ten to fifteen per cent, seems important enough to claim more than the usual share of attention at this time.

Briefly, the Power Prover Service created by Cities Service Company, entails a thorough analysis and offers a recommended plan for the operator to obtain greater efficiencies. By placing a tube from the Power Prover in the exhaust pipe of a motor, it is possible to analyze the exhaust gases and detect gasoline wastage which otherwise would be unknown. The result of combustion efficiency is registered on a dial. If power is being wasted (when combustion efficiency is low) the cause can generaly be traced to defective spark plugs, faulty timing, ignition or carburetion. An operator who knows what the maximum combustion efficiency of a motor should be, using tools especially designed by the Company, can easily adjust and tune any motor until the dial indicates that maximum combustion efficiency has been reached.

It is further pointed out that the actual gasoline savings are in many cases minor, as compared to the savings in reduced maintenance costs, reduced oil consumption, improved operation and general stepping up of motor efficiency, resulting from the use of this service.

Before presenting this report to readers of FLEET OWNER, our Editors asked the usual question, "Who's using it?" and the following interesting examples were given, in order to bear out the company's claims:

One of the largest meat packers in the East, Adolph Gobel, Inc., operates over 90 trucks in their Brooklyn (N. Y.) division. On March 19th, before using the Power Prover, it is stated, the average miles per gallon attained by this fleet was 6.068. A few days later the machine was installed in their garage. On September 3rd, a check-up showed that the average m. p. g. had been increased to 7.667, a gain of over 25 per cent. Here are the figures, showing the increases on various types of vehicles operated by this firm:

BEFORE:

4 Weeks Ending March 19th:

15 2-ton Whites
miles per gallon 5.73
41 1½-ton Whites
miles per gallon 4.78
12 1½-ton Chevrolets
miles per gallon 4.06
5 1½-ton Chevrolets
miles per gallon 9.70
3 5-ton Whites
miles per gallon 2.54

AFTER:

4 Weeks Ending September 3rd:

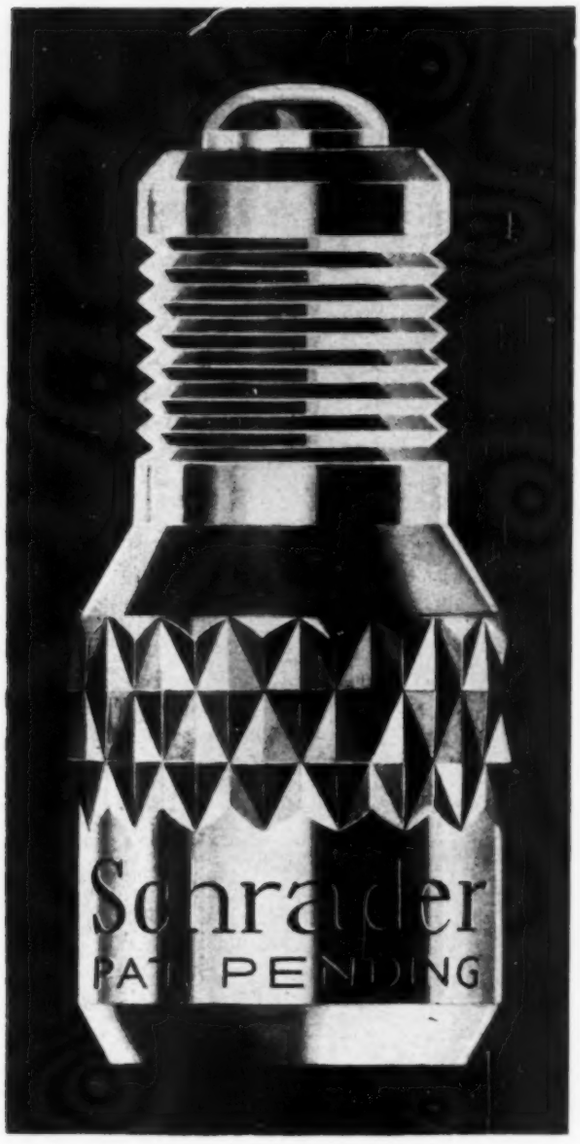
14 2-ton Whites
miles per gallon 7.82
45 1½-ton Whites
miles per gallon 6.65
10 1½-ton Chevrolets
miles per gallon 5.60
6 1½-ton Chevrolets
miles per gallon 10.59
3 5-ton Whites (not Power Proved)
miles per gallon 2.65

It is interesting to note that on the three 5-ton Whites, which were not subjected to this service, the increase in miles per gallon was negligible. These figures were secured through the courtesy of Louis Behre, Manager of Transportation.

Another concern which is said to have obtained satisfactory results by using this service is the Continental Baking Company. From their garage at Jamaica, N. Y., their fleet, consisting of 57 vehicles (Whites, Fords and Dodges), operates over 800,000 truck miles per year. In May, before this service was installed, their fleet miles per gallon averaged 8.87. By September 24th, miles per gallon had been stepped up to 9.82, an increase of 10.7 per cent. Their gas saving alone amounted to 9.7 per cent, Cities Service engineers point out. These figures were secured through the courtesy of Fred W. Moran, Manager of Transportation.

One of the first companies to use the Power Prover Service was the Community Traction Company of Toledo. About a year ago it was announced that this Company, which operates a fleet of more than 100 buses, had effected a saving of 5,500 gallons of gasoline in a single month. Today this same company has increased its monthly gasoline saving to 6,500 gallons. Miles per gallon rose from 4.24 in May, 1930, to 4.81 in June, 1932, an increase of 13.4 per cent, it is stated.

The above are but a few examples of the results that have been called to our attention by the Cities Service Company, directly traceable to the Power Prover Service. Should you be interested in learniug more about the availability of this service to your fleet, write to the Editor for full details.



SCHRADER No. 7006 DUBLCHEK VALVE CAP

FIFTEEN superior features and Schrader engineering precision make it the best valve cap of its type. Permanent—can't be lost. Effectively shuts out dirt, dust and grit. A double check against loss of air—even should valve core become damaged. Guaranteed air-tight up to 250 lbs. if affixed according to directions. *Saves four operations in inflating every tire.*

It's wasteful to let tire mileage slip away

NOBODY needs to tell you that under inflation is the greatest thief of tire mileage. And the big bone of contention when the matter of "adjustments" by the dealer comes up. Save the mileage and avoid controversy . . . . Make inflating and gauging easy for your drivers and service men, and you minimize tire-pressure neglect.

Hand soiling and time-wasting fussing with removable valve caps end when tire valves are equipped with Schrader Dublchek Valve Caps. They're permanent . . . . There's nothing to unscrew and replace . . . . There's an extra valve in the cap itself. Snap on the chuck and let the air in. Apply the gauge and read the pressure. That's all.

Mitey in size, mighty in mileage-saving economy—are Schrader Dublcheks. Their cost is trifling; their value inestimable. Equip your trucks, buses or delivery cars *now*. Your regular supply house has, or can quickly get, them for you. A. Schrader's Son, Inc., Brooklyn, Toronto, London—*Makers of Pneumatic Valves since 1844.*

Schrader

Reg. U. S. Pat. Of

TIRE VALVES TIRE GAUGES

Be sure it's a Schrader—Look for the name

INFLATE AND TEST PRESSURE THROUGH VALVE CAP . . . No dust and valve caps to remove and replace.

Say "I saw it in FLEET OWNER"—It Helps!

CARRIES RACING CAR CROSS COUNTRY

AN interesting example of unusual use of a truck unit is seen in the recent trans-continental run of a 1½-ton truck, from Los Angeles to New York, carrying as a load the "Mallory Special" racing car. Here are the details:

Leon Duray, special racing representative for the Mallory Electric Corporation, together with the racing car itself, were in Los Angeles. They were booked for appearance in Europe to compete in the early September races at Monza, Italy, including the Grand Prix. In order to make the trip they had but a few days to catch the *Isle de France* in New York City, but they made it and established what is claimed to be a new record.

The truck is a new Model BB Ford. The racing car with extra equipment, such as tires, gears, etc., weighing about 1,500 lbs., were mounted on the 157 inch wheelbase truck with a special platform body 7 feet wide and extending 7½ feet in back of the axle.

Wilbur Shaw drove the truck from Los Angeles to New York, the entire trip consisting of 3,130 miles. He accomplished this in but a few days, leaving Los Angeles 7 A. M., August 20th and arriving in Bound Brook, N. J., (adjoining New York City) on Wednesday, August 24th, averaging approximately 600 miles per day. An interesting angle from a speed standpoint is that Mr. Duray traveled by limited trains, yet the truck was ahead of the train for most of the trip.

No service or tire trouble was experienced during the entire trip, excepting for a short stop made at Winslow, N. Mex., merely to change a fan belt which was too tight.

The truck was greased only twice, once at Clinton, Okla., and once at Wheeling, W. Va. No oil was added from Los Angeles, to Amarillo, Tex., when one quart only was needed.

There was only one complete change of oil and that was made at Tulsa, Okla., and only 21 quarts of oil were needed for the 3,130 miles. Two hundred and ninety-eight gallons of gasoline were consumed and this low consumption of fuel is unusual, considering the continual mile-a-minute speed. The truck was almost continually driven between 60 and 70 miles per hour.

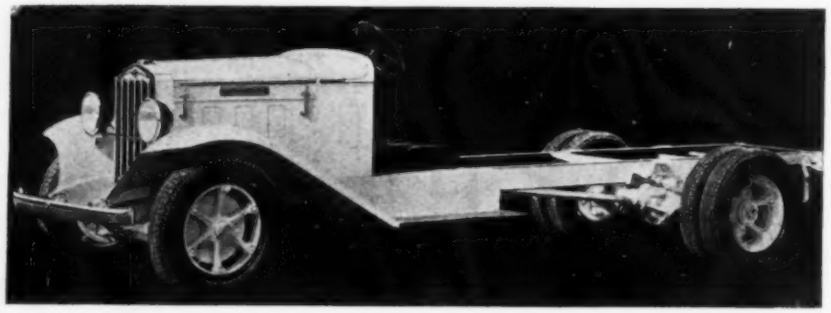
Needless to say, this equipment reached New York in time. It was put aboard the *Isle de France* and, when the steamer docked in France, the truck proceeded across France and the Alps, and into Italy.

NEW 1½-TONNER BY DIAMOND-T

DIAMOND T offers a new 1½-ton Model 210SF, which is said to be a development of the Model 210, previously manufactured by this Chicago truck maker.

One of the features of the new truck model is the provision for a choice of axles, depending upon the nature of the service. With single tires, the standard chassis employs a semi-floating axle with one-piece cast housing of electric-furnace steel. When dual tires are required, a full-floating rear axle of similar size and capacity is provided, but which offers the advantage of placing the wheel bearings directly above the center of road contact. With this type of axle, it is known as Model 210FF.

The new Models continue the use of the 3⅜ x 4¼-inch, six-cylinder Hercules engine, having a piston displacement of 228 cu. in. This engine features a 7-main bearing crankshaft and is rated at 60 h.p. at 2,800 r.p.m. It is an L-head job of conventional construction, with



down-draft carburetion, pressure lubrication, electric starter, generator and distributor.

Clutch is a single-plate job, with moulded facings, and flexible center. A four-speed, unit-power-plant transmission is employed. Spicer universals are at both ends of the drive shaft. Steering gear is of the cam-and-lever type, with ball bearings in the steering head. Springs are of the semi-elliptic type.

Braking system consists of Lockheed internal-expanding, hydraulic 4-wheel brakes, with the hand brake, of the contracting type, mounted on the transmission shaft. Tires are 5.50-20 balloons in front; 6.50-20 rear. Larger tire equipment is optional, including dual rear tires on Model 210FF. Wheelbase is 135⅛ inches standard, with a special wheelbase of 158 inches optional at extra cost. Wheels are of the metal spoke type.

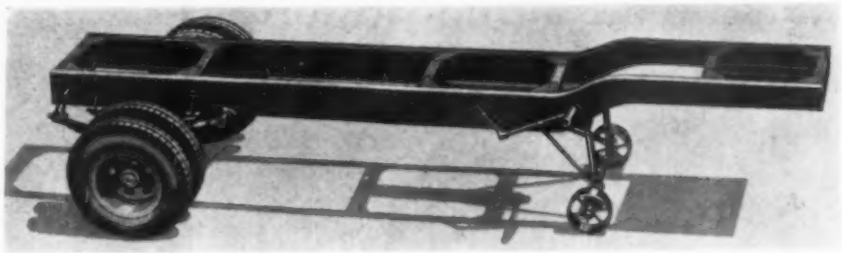
The maximum gross capacity of these models is 8,500 lbs. Weights are as follows: Chassis, 3,100 lbs. Cab, 420 lbs. additional.

TRUCK-BUILT TRAILERS BY G. M. T.

TWO new trailers, providing greater carrying capacity with less chassis weight, are announced by General Motors Truck Company, Pontiac, Mich. These models are the TT-252 semi-trailer with a payload capacity of from five to ten tons, and the TT-418 four-wheel trailer, with a three to five ton payload rating.

Various economies are made possible through these new trailers, due to the fact that a high payload capacity has been accomplished with less than the usual dead-weight, it is claimed. Strength of frame is assured through use of one-piece pressed steel side rails in the semi-trailer with a depth of 11-15/16 inches and six deep channel cross members. Also a larger axle beam and heavy auxiliary type springs are provided.

Attention has been paid to the design of the fifth wheel in the semi-trailer, its construction enabling the driver to couple and uncouple without assistance. In the fifth-wheel design there are only two major moving parts, the hardened nickel-steel latch and the release lever. The upper fifth-wheel is stationary and integral with the frame, giving strength without excess weight and consisting of a steel plate ⅜ inches thick across the entire width of the frame, supporting a hardened king pin. This construction is further reinforced by a large special pressed steel member. A pressed steel ramp on the lower fifth-wheel saves weight and provides a gradual pick up, lessening the shock of coupling and saving truck tires.



Locking is accomplished automatically when coupling, while a pull on the lever is all that is necessary to uncouple. Flexibility is assured by a universal G. M. T. lower fifth-wheel which compensates for a difference in elevation of about two feet between the truck and trailer wheels. Coupling at right angles is possible. Two heavy springs on the lower fifth-wheel absorb the coupling shocks.

A wide range of height adjustment is provided through the use of improved supports, giving an adjustment of 7½ inches for various tractor and tire heights. The worm support screw and floating bronze nut are housed in a metal shield to keep out dirt, grit and snow, assuring easy operation. Bevel gears are also fully enclosed. Another feature of these trailers is that a large proportion of the wearing parts of both tractor and trailer are interchangeable.

The TT-418 four-wheel trailer is of one-piece pressed steel drop-frame construction, which results in a lower center of gravity. The frame is 8¾ inches deep and is strengthened by channel cross-members. The front end is inswept to provide a maximum turning radius.

Other features of this trailer include an improved draw-bar of seamless steel tubing, stronger and lighter in weight, heavier axles, 2¾ inches square with a heavy-duty plain bearing turn-table and demountable disc wheels.

1933 MODELS OFFERED BY F. W. D.

THE Four Wheel Drive Auto Company of Clintonville, Wisconsin, has announced a complete new line of heavy-duty trucks for 1933. The models range in size from the 2 to 2½-ton four-wheel-drive to the 15-ton six-wheel drive, and incorporate many new improvements. Special mention is made of three primary models, featured for use in major industries; they are the H6 of 2-2½ tons capacity, for road maintenance; the CU6 of 3½-4 tons capacity, for road building and snow removal; and the X6 for milk and petroleum service. Each of these trucks incorporates the basic four-wheel-drive principle of propulsion and such refinements as are applicable to their field of use.

The H6 model, for road maintenance, is powered by a six-cylinder motor of 315 cubic inch displacement that develops seventy-two brake horsepower. This motor carries a seven-bearing crankshaft and is equipped with the regular high turbulence cylinder head found on all FWD engines. Drive to all four wheels is affected through a four-speed transmission and new heavy-duty transfer case suited for continued service in the lower gear ranges. Top speed with the standard gear ratio is 35 miles per hour, with other ratios permitting speeds of from 24 to 43 miles, as desired. The short wheelbase of 133 inches and 60-inch tread permits the easy maneuvering so necessary in highway work.

(Please turn to page 34)

QUESTION *of the* MONTH

"By far, one of the most valuable departments to be found in any automotive publication. Every fleet man should be delighted to cooperate."—A Reader

What Our Survey on Governors (No. 24) Revealed:

Governors Save $70,000 Yearly

"GOVERNORS on a fleet of vehicles reduce operation costs and increase gasoline mileage. We used them on our fleet of salesmen's cars and found them to bring about definite savings as high as one cent per mile, or $70,000 per year.

"We found them to reduce total operation and maintenance costs, engine repair costs, tire maintenance costs, fuel consumption, lubrication and brake maintenance costs. These governors were set at 48 m. p. h. maximum.

"We discontinued the use of governors because we were improperly equipped to check and service them. Cars are sometimes kept at home by salesmen and there is no field supervisor or inspector available. There was a decided increase in expense after removing the governors."—*E. E. Alexander, Auto Supervisor, U. S. Gypsum Co., Chicago, Ill., operating a fleet of 52 trucks and 308 passenger cars.*

Bus Operator's Governor Experience

"EIGHTY per cent of our bus fleet is governor equipped. Our drivers object to them, but not seriously. The benefits derived are: lower engine maintenance, less bearing trouble and less piston breakage. The disadvantage is that sometimes the driver is unable to get into lower gears when descending hills; also sometimes unable to get additional speed to pass other vehicles on the road.

"We prefer the centrifugal and gas-velocity types. They are set to a maximum speed of 50 m. p. h., or 1,900 to 2,800 r. p. m., and are sealed and inspected regularly.

"All maintenance costs have been reduced as a result of governors, and while we know that our maintenance costs have been cut, we have not set up our records to show this comparison."—*C. A. Martin, Supt. of Maintenance, White Star Lines, Inc., Washington, Pa., operating a fleet of 133 buses.*

25 Per Cent Reduction in Costs

"ALL of our fleet is equipped with governors. Some of the drivers object to them, but we find that they bring about a reduction of accidents and have reduced maintenance costs by about 25 per cent.

"On our passenger cars the governors are set at 45 m. p. h.; on the trucks 35 m. p. h. They are sealed and inspected regularly every 30 days. We believe that governors increase the life of our fleet and prefer the velocity type."—*L. Faulkner, Engineer, Armour & Co., Stock Yards, Chicago, Ill., operating a fleet of 2,000 trucks and 1,000 passenger cars.*

No Disadvantages in His Opinion

"GOVERNORS offer no disadvantages in our opinion, and 90 per cent of our trucks are so equipped. Our drivers do not object to them and they offer the benefits of decreased operating expenses plus safety from a general operating and accident standpoint.

"We prefer the fly-ball type and set our governors at the manufacturers' speed recommendations for the vehicle on which the governor is used. They are sealed and inspected regularly.

"There has been a general reduction brought about by the use of governors, including operation and maintenance costs, engine repairs, tire maintenance, lubrication, fuel consumption and brake maintenance costs. Governors do increase the life of our fleet."—*C. P. Storer, Motor Vehicle Supervisor, Bell Telephone Company of Pa., Harrisburg, Pa., operating a fleet of 60 trucks and 150 passenger cars.*

Governors Reduce All Items of Expense

"ABOUT seventy-five per cent of our fleet is governor equipped. We find that the drivers have no reasonable objections to them. As to the benefits, they have fewer accidents, less costs on all maintenance, items, including motors, chassis, tires, etc.

"We prefer the centrifugal and gas velocity types. Our governors are set at 45 m. p. h., maximum for the passenger cars; and 25 to 35 m. p. h. on the trucks. They are inspected monthly and sealed when changed.

"Governors do increase the life of our vehicles and our records show that they have brought about a reduction in all the items mentioned in the questionnaire on this subject."—*C. T. Whipple, Garage Supt. Mid-Continent Petroleum Co., Tulsa, Okla., operating a fleet of 96 trucks, 2 trailers, 168 passenger cars and 23 tractors.*

Biggest Factor in Reducing Costs

"NO one factor has been more responsible for reducing the costs of operating our vehicles than governors. Our fleet is 85 per cent equipped with them.

"When governors were first installed, our drivers objected to them, but not now. We believe that they increase the economical life of the vehicle, lower operating costs and reduce accidents.

"Some of the disadvantages are: Governors require maintenance work; in some cases where vehicles are governed low, the power is affected unless gear ratio change is made.

"Our passenger car governors are set at 45-50 m. p. h. maximum; the trucks, 25 to 35 m. p. h. We prefer

(*Please turn to following page*)

A FEW of the GOVERNOR REPORTS (Continued)

the velocity type and inspect and seal our governors regularly. As a matter of fact, governors materially reduce all operating and maintenance costs. They increase the life of our passenger cars by about 10,000 to 15,000 miles."—*L. V. Newton, Automotive Engineer, Byllesby Eng. & Management Corp., Chicago, Ill., operating a fleet of 800 trucks, 250 buses, 400 trailers and 1,865 passenger cars.*

An Interesting Governor Test

"WE made the following test on one T-19 G. M. C. truck which we purchased in 1928. This truck was making daily runs on a long haul, about 125 miles without stopping and when it had done 47,000 miles we had to pull the motor down and install new pistons, etc.

"Before the truck left the shop we installed a ——— governor and set it to 30 m. p. h., then put it in service, with the same driver, on the same run. Up to the time we discontinued the route, the truck had travelled 51,000 miles since the motor was reconditioned and it is still in good shape. In fact, since the route was abolished we have used the truck daily on short hauls. And to date it has run 61,021 miles total since overhauling the motor.

"The governor has never been readjusted or repaired and the motor is still in fair condition. Our drivers have never complained about the power, etc.

"On a long haul we believe a good governor will save the owner many dollars. But on light deliveries making from 200 to 300 stops per day, with good drivers, we are not ready to say whether it would be a good investment or not.

"We have always found that by keeping his truck in tip-top shape and compensating him for low cost per mile, a driver will always bring in his best results. Driving a sluggish truck will ruin a driver's good spirit and the truck will receive unnecessary abuse."—*R. H. Fassett, Garage Supt., El Paso Laundry & Cleaners, El Paso, Tex., operating a fleet of 24 trucks and 8 passenger cars.*

Reduce Repair and Maintenance Expense

"ALL our units, both passenger cars and trucks, are governor equipped. Drivers do not object to them. Governors reduce our repair and maintenance expense, as well as eliminate accidents. They offer no disadvantages so far as we can see.

"Our governors are set at different speeds: local conditions determine their setting. A proper governor on an automobile or truck will help to reduce all the maintenance items which you list, as well as lengthen the life of the vehicle."—*R. R. Rowe, Wilson & Co., Chicago, Ill., operating a fleet of over 100 trucks and 100 other assorted vehicles.*

(Please tear out and mail to The Editor, The Fleet Owner, 90 West St., New York City)

Question No. 26—Replacements

Is your fleet maintained on the unit replacement plan? .....

What spare units are carried in stock? (Please check below)

☐ Engines; ☐ Clutches; ☐ Transmissions; ☐ Rear Axles; ☐ Front Axles; Others .....

What other parts do you carry in stock? (Please list) .....

.....

.....

What is your main source of replacement parts supply? (Please check below)

☐ Vehicle Manufacturers' Dealers; ☐ Automotive Jobbers; ..... Others

What parts are obtained from the Vehicle Manufacturers' Dealers? .....

.....

What parts are obtained from Automotive Jobbers? .....

.....

Please outline any advantages or disadvantages you have experienced in obtaining parts from either or both of these sources .....

.....

.....

.....

Are parts needed at night? ..... If so, who gives best night service? .....

Remarks .....

.....

.....

How many vehicles in your fleet?

.....Trucks, ...Busses; .....Trailers; .....Pass. Cars; .....Others.

Note: If you cooperate with us and fill out this questionnaire, you will be entitled to a tabulated report covering all of the answers.

Swap your Replacements experience with other fleet operators in this easy, convenient way. We do the work. You get the benefit.

Name of Firm .....

Address .....

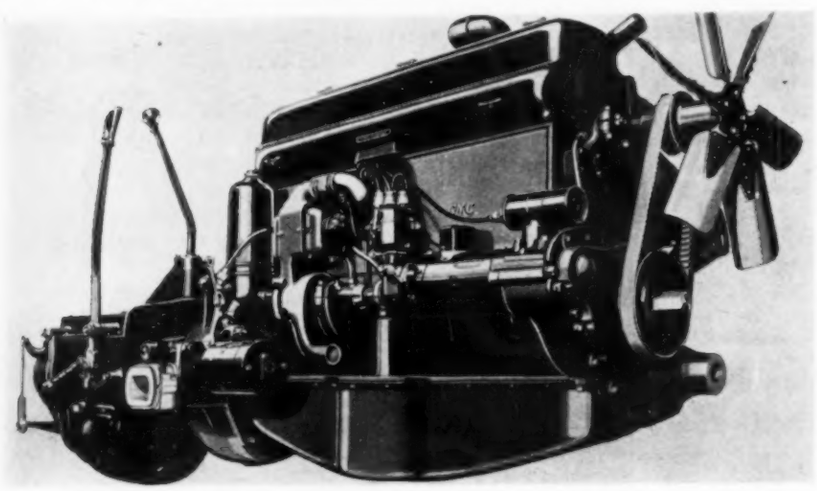
City and State .....

Your name .....*Position*.....

NEW 400-CU.-IN. G. M. TRUCK ENGINE

A 6-CYLINDER engine of 400 cubic inches displacement, developing 296 foot pounds of torque over a speed range of from 800 to 1,600 r. p. m. and 112½ brake horsepower at 2,800 r. p. m., has been introduced by the General Motors Truck Co., Pontiac, Mich.

Through this high torque maintained over a wide speed range, marked economy of operation is claimed, less gear shifting is required and greater performance is obtained. The engine will be used in trucks of from five to seven-and-a-half tons capacity.



Among the many improvements is the use of Stellite-faced exhaust valve seats. The exhaust valve seats are of the threaded removable type, consisting of an outer shell of special alloy steel faced with Stellite, and installed with the use of dry ice. The wear-resisting characteristics of this type of valve seat reduces seat pounding and the need for valve adjustment to a minimum. In motor coach operation, engines with valve seats of this type have operated approximately 18,000 miles a month or nearly a quarter of a million miles a year without any appreciable amount of wear being encountered, it is declared.

Another feature of this engine is the oil temperature regulator, which insures a constant temperature of the oil in circulation during operating periods, while lubrication to all moving parts, including piston pins, is maintained through full pressure lubrication.

Two functions are performed by this oil temperature regulator. First, it serves as an oil cooler and prevents a rise in temperature to a point where the lubricating quality of the oil might be impaired under continuous high speed driving. And, second, it serves as an oil heater when the engine is started by transferring heat of the warmer radiator water to the cold oil thus aiding the flow of oil to the engine bearings.

The 400 cubic inch G. M. T. engine is of the overhead valve type, with dome-shaped combustion chambers. Intake valve openings have Venturi type throat, resulting in a greater increase in flow of the explosive mixture. Pistons are constructed of special heat-treated aluminum alloy with floating piston pin. Smoothness of operation is particularly featured in this engine, statically and dynamically balanced counterweighted crankshaft with harmonic balancer serving to remove vibration.

FWD's 1933 Models

(*Continued from page* 31)

Some of the other advantages listed by the manufacturer are high road speed, good traction due to four-wheel-drive, capacity to operate for long periods of time in low gear trains, and the wide range of operation. The unit, when equipped with a dump body, underbody or pull-type grader, and snow plow, makes an all-year, all-purpose maintenance unit.

The CU6 of 3½-4 tons capacity is designated as the road building and snow removal truck. It has been developed over a period of several years and the earlier models are known to practically every state highway department in the United States. The new model for 1933 has a decided improvement in appearance and many mechanical advantages over its predecessors.

The new cab is of the aero-dynamic type with an internal sun visor and has all the appointments of a pleasure car, including rear-view mirror, windshield wiper, and a redesigned dash with indirectly lighted airplane type instruments in a unit panel. Side vents at either side of the floor board and dual rear windows provide ample air circulation for hot summer days.

The X6 model of 6 to 10 tons capacity is a four-wheel-drive six-wheeler, designed especially for the heavy hauls encountered in milk and oil service. Radically different from the conventional four-wheel-drive six-wheelers, this unit is powered on the front and first rear axle. The extreme rear axle is a load-carrying member only. This permits the use of the regular FWD center differential between the driving axles, to compensate for the variations in wheel travel when turning corners or traveling over rough roads.

Power is supplied by a 110 horsepower six-cylinder engine of 517 cubic inch displacement and is featured as being very economical to operate. According to the manufacturers, the new manifold design, combined with the patented high-turbulence head, is responsible for the increased power and economy of operation.

Complete description of the various models in the new FWD line is not possible here, but the Four Wheel Drive Auto Company, Clintonville, Wis., will be glad to send printed literature on request. You'll mention FLEET OWNER, won't you?

Reo Branch Moves

REO Sales Corporation of Atlanta has moved to a new location at 449 W. Peachtree St., it was recently announced. The new place of business, compared with old, furnishes more convenient and larger quarters for all of the activities of the organization, including new car, used car, service and parts departments. G. D. McCracken, is general manager.

Chevrolet Production

FIGURES for the first six months of this year covering commercial car registrations show that Chevrolet titled 36,049 trucks as against 100,564 units for the industry, or 35.8 per cent of the total. The second leading make registered 33,492 trucks, or 33 per cent of the total, which represents the output of 33 truck manufacturers.

BURNS FURNACE OIL *in* BUS, TRUCK ENGINES

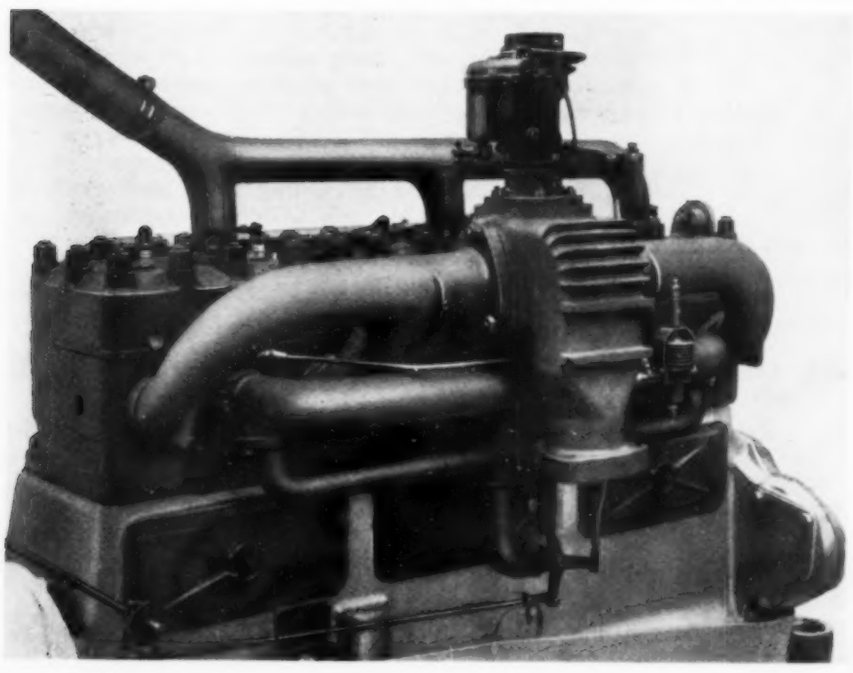
FLEET operators have for many years looked forward to the substitution of some fuel in place of gasoline, such as distillate, or furnace oil, as a means of reducing one of their most burdensome operating expenses. But though numerous devices have attempted to utilize such fuels, inherent difficulties have seemed to always accompany them, such as inabilities to manage such a device, failure of the device to prepare and handle the fuel properly, etc., all of which have kept this desirable economy beyond the reach of fleet operators.

Of particular interest in this connection is the recently announced Paragon Fuel Vaporizer, described elsewhere in this issue, which is claimed to closely duplicate gasoline performance at a greatly reduced fuel cost. Here are the details as pointed out by the manufacturers:

The Paragon Fuel Vaporizer, without additional moving parts, prepares and feeds "furnace oil" to an engine, the air and fuel being mixed in a modified standard carburetor and traveling through the exhaust-heated vaporizer chamber. Here the fuel-air mixture is whirled or turbulated, and subjected to heat. This portion of the system breaks down the fuel droplets and tends to gasify them. Observed through a glass window inserted in the wall of the intake manifold, the fuel is described as being what is called a completely "dry" mixture. The illustration accompanying this article shows how the device looks when mounted on a six-cylinder, 5 x 5¾-inch heavy duty engine. Inasmuch as the vaporizer is located between the carburetor throttle and the intake manifold, the fuel mixture is subjected to the manifold vacuum and reaches the intake ports without having its pressure characteristics disturbed, due to the design of the vaporizer. In the high load range, cold air is introduced to the fuel-air mixture in correct proportion and under conditions which are said to prevent precipitation of the fuel.

An ideal fuel mixture is one that is as cold as possible without being so cold that droplets of fuel will return to their original liquid state. The colder mixture is better, simply because a hot mixture expands, so that less of it can be delivered to the engine, thus reducing the efficiency. It is stated that with the Paragon Vaporizer the mixture is always relatively cool and reaches the engine in a fog or dry state, conducive to smooth running, good power development and real operating economy at all load ranges. The system is entirely automatic and continuous and the operator is not required to pay any particular attention to it, the manufacturers explain.

In tests and experiments it has been demonstrated that this system is especially adapted for trucks, tractors, buses, air-compressors, shovels and similar heavy-duty, internal-combustion units. Developed especially for this field, the system does not at present appear sufficiently economical for wide use on lighter engines. In fact, on heavy-duty engines it is said to closely approach Diesel economy without sacrificing gasoline performance or flexibility.

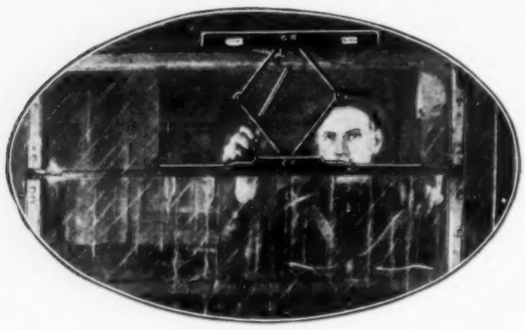


As with all things, experience is usually the best teacher, and the manufacturers pass along to us the following report on a mid-west fleet operator's experience with the Paragon Vaporizer. For more than a year this operator has used the vaporizer in every-day operations on a portion of his heavy-duty fleet which made a regular 650-mile return run, in which a total of more than a quarter million miles were piled up. Here, according to the report, the vaporizer slashed fuel costs very sharply. A typical cost record with and without the vaporizer follows:

Number of vaporizer-equipped engines	5
Cost of gasoline (excluding tax)	6.78 per gal.
Cost of furnace oil	4.31 per gal.
Miles covered per month	48,515
Fuel cost, furnace oil, with vaporizer	.0139 per mi.
Fuel cost, gasoline without vaporizer	.0199 per mi.
Percentage of saving in fuel cost	30.1 per cent.

It is well known that furnace oil contains sufficient energy to make a good fuel, the main problem in the past being the proper preparation of that fuel correctly for use in existing engines. These similarities are pointed out: Gasoline is volatile, yet it takes almost exactly the same amount of heat to evaporate a pound of furnace oil as pound of gasoline, excepting for the fact that the heat must be applied in a more concentrated manner to the furnace oil. Also: Droplets of gasoline in an air stream form an explosive mixture. The same is true of furnace oil, but the furnace oil must be nebulized, or broken down at least 20 times as fine. When these characteristics are handled properly, the furnace oil becomes virtually the same fuel as gasoline, and the Paragon Vaporizer does exactly that, according to the manufacturers.

Although we have attempted to fully describe this device in this article, it is possible that further details, installation data, and performance records might be desired by fleet maintenance men. If you are interested and would like us to have literature sent, without obligation, the Editor will be glad to see that your request gets prompt attention. Or, if you prefer, you can correspond directly with Climax Engineering Company, 111 W. Monroe Street, Chicago, Ill.



NOW *is the time your trucks need this* CINCH *Vertical* Windshield Wiper

Right now . . . before the bad weather arrives . . . is the time to equip your trucks with windshield wipers. And only a *dependable* wiper will do . . . because your fleet must operate regardless of the weather.

It means *dollars* to you.

The Cinch *Vertical* Windshield Wiper has been proved dependable through actual use amid grueling, storming battles with the elements. Its *downward* stroke, an exclusive Cinch feature, is the only *practical* way to clean off rain, snow and sleet. Its operation is simple. Construction rugged. Installation easy. And price is amazingly economical.

Dairy and bakery truck-fleets, bus and transportation lines throughout America have used the Cinch Wiper for over 5 years with great satisfaction. Standard equipment on leading street railway lines!

Without obligation, let us send you prices and full particulars. Write *today!*

C I N C H
MANUFACTURING CORP.
2335 W. Van Buren St., Chicago

Total Mileage or Safe Mileage?

THERE is a startling difference between the amount of safe mileage and the total mileage which an automobile tire delivers, it was revealed by the United States Rubber Co., in a recent survey involving inspection of thousands of tires on cars in all parts of the United States.

Safe mileage is regarded by tire engineers as those miles driven before the tire tread wears smooth. Total mileage, of course, represents the number of miles obtained from the time the tire is put on the car until it is discarded.

However, in driving on a smooth tread there is a loss of traction provided by the original design, which increases the danger of slipping and sliding on wet or icy streets. This also increases the chances of having a puncture or blowout, with its attendant inconvenience and possible disaster.

A large percentage of tires on the road today, the survey showed, have worn past the point of safety. No statement was made as to whether fleet operators' tires were included in the survey.

Form Illinois Highway Users Association

THOUSANDS of users of the highways of Illinois, especially those firms and individuals who utilize the roads in pursuit of their daily bread, are rallying to support a new statewide organization, known as the Illinois Highway Users' Conference. Recently chartered by the state, the organization is based on the general plan of the National Highway Users' Conference. Its incorporators include: M. Ready, president, Ready Coal and Construction Company; Robert T. Hendrickson of the Hendrickson Motor Truck Company; and F. E. Ertsman, secretary of the Illinois Motor Truck Owners Association. Mr. Ertsman is secretary of the Conference and is in charge of its offices in the LakeMichigan building, Chicago. Lafayette Markle, president of the Chicago Automobile Trade Association, has been chosen chairman of the Conference. Vice-chairman and members of the advisory committee are now being named from various parts of the state.

The trades have been quick to respond to the appeal of the new organization, explained Mr. Erstman. "Of course, all branches of the automotive industry are interested in the Conference," he said. "But so are the operators and miners of coal, contractors and builders, and such industries as: dairy products, grain and feed, wholesale and chain store groceries and meats, gasoline and oil, hardware, engineering firms, laundries, ice cream and ice, traffic mill and factory supplies, packing and shipping, hotels, tires and rubber, cartage, waste removers, warehousing and distributing, stone and gravel, excavating and trucking, and associated industries. We welcome the members of these trades and the farmers of Illinois, as well as other motorists, into the Illinois Highway Users' Conference, and shall be glad to send them further information if they will write to us."

U. S. Plywood Opens Chicago Office

THE United States Plywood Company, New York City, manufacturers of ARMORPLY, announce the establishment of offices at 333 North Michigan Avenue, Chicago, under the direction of George N. Lamb.

Extensive warehouse facilities have also been provided in order that complete stocks of ARMORPLY, the well known metal faced panel for truck body construction, may be available for immediate delivery to any part of the Chicago District.

98 Per Cent Governor Equipped

"WE use governors on 98 per cent of our fleet. While there were some comments by the salesmen-drivers when governors were first installed, this has become a matter of acceptance with them and we no longer hear any objections.

"We feel that the principal benefit to be obtained from a governor is to insure operating the car at a reasonable speed, and, in the event of our failing to receive proper service from any of the parts in the car, we have a better chance to secure reimbursement from the manufacturer, when it is shown that this trouble could not have been caused by driving the car at an excessive rate of speed.

"In certain territories it is necessary to open the governors slightly during the winter season in order to give the car greater pulling power at low speeds.

"Of course, it is a little more difficult to drive a car equipped with a governor as you must judge carefully before endeavoring to pass another car on the road. The maximum speed at which we set our governors is 45 m. p. h. All governors are sealed or locked and the supervisor checks the operation of governors about once every three months.

"We have not endeavored to compare costs before and after installing governors but, as stated above, we believe there is less possibility of motor difficulties in units equipped with governors."—*A. A. Heinz, General Cigar Co., Chicago, Ill., operating approximately 160 vehicles.*

Unique Fleet Safety Record Made

A SAFETY record considered unique in the history of New York traffic records has just been completed by a group of parcel delivery men connected with the Jamaica sub-station of the United Parcel Service, a company which handles deliveries for 180 New York retail stores.

The 18 drivers of this station went six months without a single accident, covering a total of 74,190 miles in that period and being out on the streets and highways of Jamaica and congested sections of Long Island every business day, in all kinds of weather. The record is said to be outstanding, never before having been equalled by any store delivery group in the New York metropolitan district.

The United Parcel Service employs 800 delivery men in the New York territory, these men working out of various sub-stations from which store parcels are distributed. The company has been conducting a vigorous drive to curtail accidents, each of its station groups engaging in a contest for the best record. The Jamaica men won a Safety Pennant and a banquet for their achievement.

SKF Hartford Factory Moves to Phila.

SKF Industries Inc., of New York, supervising The Skayef Ball Bearing Company of Hartford, Connecticut; The Hess-Bright Manufacturing Company, Atlas Ball Company, and SKF Research Laboratory, of Philadelphia, have announced the consolidation of the manufacturing activities of The Skayef Ball Bearing Company of Hartford with The Hess-Bright Manufacturing Company, at Philadelphia.

This action on the part of SKF Industries Inc. will give effect to the advantages of concentration of manufacturing and research activities.

The complete line of products previously manufactured at Hartford will be continued at Philadelphia.

BLAME YOURSELF

Powerful reserve braking power is an absolute need in a tight pinch. An ordinary "parking" brake is worse than useless.

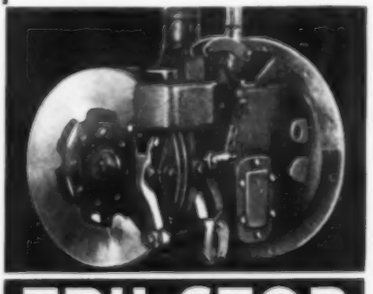
•

The TRU-STOP Emergency Brake is more than a parking brake . . . it is a real emergency brake, capable of handling the entire load in case service brakes prove inadequate.

•

It is easily installed on any bus or truck. Practically all of the newer models are TRU-STOP equipped . . . but to be sure, specify "TRU-STOP" EMERGENCY BRAKES.

AMERICAN CABLE COMPANY, *Inc.*
Automotive Division
BRIDGEPORT, CONNECTICUT
3-111 General Motors Building, Detroit, Michigan



TRU·STOP

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POSITIVE ACTION
POSITIVE RELEASE
VENTILATED DISC
DISSIPATES HEAT
SMOOTH ACTION
SELF-EQUALIZING
NON-SELF-ENERGIZING
EASILY ADJUSTED
EASILY RELINED
LONG LINING LIFE

NEW TIRE TOOL
Electric Hot Knife Regrooves
Treads on "Bald Headed" Tires

Now—you can get several thousand extra miles of service from your tires. The remarkable new Kwick-Kut Hot Knife Tire Groover makes it possible. . . . It recuts the original tread of any standard make tire—changes "bald heads" to non-skids. Models range in price from $4.50 to $30.00. Write for full information **now.**

Some Choice Territories Open to Live-Wire Factory Representatives.

KWICK-KUT
TIRE GROOVER
Manufacturing Co., Inc.
3821 ARSENAL ST.
ST. LOUIS, MO.

Anti-Knock Fuels Cut Fleet Costs

ANTI-KNOCK gasolines used in high compression truck engines save three mills a mile in fuel cost and reduce the number of valve grindings and bearing adjustments from seven to an average of one and one-half a year, it was shown by trucking tests recently reported to the Ethyl Gasoline Corporation. The experiment disclosing these economies lasted one year and was carried out with bus and truck fleets operating in southern California.

Increasing the compression of truck engines operating in severe service eliminated boiling of the cooling water and permitted the trucks to operate at an average of one gear higher. Operating time for a 1,000-mile round trip was reduced six hours, and the work was found to be much easier on the drivers. Fuel consumption for the trip was reduced.

Compression ratios in truck engines are now being increased by machining cylinder heads and by making other necessary adjustments for anti-knock fuel at an average cost of five dollars per engine, the report states. Truck manufacturers, the Ethyl Corporation predicts, will produce high compression engines to meet the demand for such equipment.

Expenditures on the five-dollars-an-engine scale would enable truck and bus operators to realize between fifteen and twenty per cent power increase for each vehicle, it is estimated. This enhancement of power might be utilized to shorten the running time of a truck or bus or to pull a larger load. In the case of the bus, it would probably be desirable to reduce the running time by lessening the number of necessary gear shifts and stepping up the rate of acceleration.

The operation of any truck, bus or tractor engine that has fuel or carbon knocks when ordinary gasolines are used can be improved, it is stated, by the use of anti-knock fuel.

A Biscuit-Maker Swaps Information

"WE do all of our own brake lining work, except drum truing, which is farmed out to a specialist. We use woven lining on all installations, both internal and external, and have found ———— brake lining can be successfully used on all types of brakes.

"Brake lining is purchased from a local dealer. We have no data as to the mileage given by brake lining or brake drums. We specify brake lining by make when ordering and prefer ....."—*S. H. Jones, Supt., National Biscuit Company, Chicago, Ill., operating a fleet of 27 truck and 1 passenger car.*

FREE TEST!

PECK
VALVE
INSIDES

We'll send you free of charge enough Peck Valve Insides to make a fair test. See for yourself how much longer Pecks last—hold pressure and give all around better service.

Write today for Valves!

THE PECK SPRING CO.
Plainville, Conn. U. S. A.

Name .....
Street .....
City .....

LIVE RED RUBBER *(not moulded)*

In the Heart of things
MEN OF MOTORS prefer THE HOTEL WOODWARD because of its ideal location "Right in the heart of automobile row"—its proximity to the amusement center—its quiet yet congenial atmosphere—and its modest tariff.
Rooms with Bath from $2.50
THOS. D. GREEN
Ownership-Management
Hotel
WOODWARD
•BROADWAY at 55th ST•
New York

Clean Cylinder Bores a Necessity

ARE the cylinder bores clean? That may sound like an odd question yet it is one of the most important engine reconditioning questions which could possibly be asked.

Of the many hundreds of thousands of cars, trucks and tractors reconditioned each year with new pistons, pins and rings, there probably is an appreciable percentage whose cylinders have not been properly cleaned and washed out after reboring or honing work was done. In other words these particular dirty motors haven't a Chinaman's chance of giving 100 per cent new car performance because of the abrasive, dirt and fine particles of metal left in cylinders and crankcase.

New pistons, pins and rings installed under these conditions will not give good performance; in fact the performance will be nothing short of unsatisfactory when one considers the time and money spent on the job.

Piston rings can't possibly perform their normal function of stopping oil pumping and preventing blow-by (hot gases blowing past compression rings) under such poor conditions. As a matter of fact, oil pumping is often worse after new rings have been installed than before, simply because of the dirt, grit and minute particles of metal completely clogging the slots in the oil-regulating rings. And further, the grit forms an abrasive which works its way in between the faces of the piston rings and the cylinder walls, thus causing abnormal wear to set in immediately. Usually the piston rings get the blame, too, for the abnormal wear and poor performance.

The paradoxical part of the entire problem is that the new set of the same kind of rings, replacing the set that prematurely wore out in a few thousand miles, will give excellent performance, completely stopping oil pumping and eliminating blow-by.

The correct answer to this whole problem is the proper cleaning of cylinders and the crankcase to eliminate dirt and metal which forms the abrasive. The disposal of the above mentioned foreign matter allows the pistons, pins and rings to function normally, assuring a perfect job and 100 per cent satisfaction.—*Suggested by The Perfect Circle Company, Hagerstown, Ind.*

"Vacation" Plan Reduces Fleet Accidents

FIFTEEN million miles without an accident is the record held by a regiment of taxicab drivers in the New York units of the Parmelee System for the first year of the "vacation with pay" plan just completed. The record made by the successful 1,364 taxicab drivers has proven the merit of the plan, even though it cost their employer over $19,000. Over the 15,713,280 miles the vacation winners drove their cabs without a single accident to the 11,784,960 passengers carried.

Careful driving is something which is inculcated in the minds of the cab drivers from the moment they are hired but C. J. Sinnott and E. A. Dannemann, heads of two of the Parmelee Systems' New York subsidiaries, realized that there should be a personal incentive for each driver. Dannemann and Sinnott originated and directed the plan which provides a week's vacation with pay at the average rate earned by each man during the past year. Points are given for each month the driver operates without a personal injury accident, with additional points given for regularity of employment.

The officials responsible for the plan declare that rewarding men with vacations has greatly reduced accidents, likewise insurance costs. Before this plan was adopted taxicab drivers knew no such thing as vacations, especially with pay. Regularity of employment has improved, but, best of all, the plan has greatly increased the safety of the passenger.

"In designing the Model DSM Coil, I had one thing in mind, and that was to develop a coil that was not just a little better, but much better than any other coil. First, the coil must produce hotter sparks with higher voltage and run up to much higher speeds than any other coil, and, at the same time, draw less or no more current from the battery than the ordinary coil.

The DSM Red Top Coil has two secondary units instead of one as in other coils. Each unit has 15,000 turns, making a total of 30,000 turns, which is twice the number of secondary turns as used in most coils. The greater the number of turns, the greater the voltage; thus, it can be plainly seen why this coil is superior.

In using two secondary units to obtain the high voltage, it is necessary to use a bakelite case, because coils having two secondary units will not function in a metal case. There is an IMPORTANT reason for every change in design of this coil from the conventional design of coils, and that is why the secondary output of the MODEL DSM IS GREATER FOR STARTING, RUNNING AND AT ALL SPEEDS THAN ANY OTHER COIL MADE.

The internal construction of the Model DSM Coil has been adopted by one of the world's largest car manufacturers, but not until tested against all other makes. Nor was it adopted as are most coils, because it was cheaper. There are over 200,000 of these coils, which have been built during the last six months, now in use.

If every service man and fleet owner could see a comparative test between this coil and all other makes, I am sure they would select it in preference, even though higher in price."

A real heavy duty coil for buses and trucks—either 6 or 12 volt ignition systems. Use with 12 volt resistance unit for 12 volt ignition.

Mallory Model DSM Coil
"RED TOP"

Mallory Electric Corporation
Vancouver Ave. & P. M. R. R.
DETROIT, MICHIGAN, U. S. A.

This Operator Stopped Coil Cushion Repair!

He operates 68 trucks. Keeps a close check on all maintenance items. Repairs his truck cushions twice a year. Checked his records back three years and found he was spending *$12.00 per year per truck for cushion repair!*

Now he uses Sponge-Aire cushions because they *never need repair—yet cost no more than coil cushions.*

Write for more particulars today.

SPONGE-AIRE
SEAT COMPANY, INC.
1433 MAIN ST. BUFFALO, N.Y.

THE NEW WAY
TO BUY A TRUCK

REO "ABILITY RATING" . . . Takes the Guess-work out of TRUCK PERFORMANCE

● Reo's new "Ability Rating" plan revolutionizes truck buying. Buy no truck until you read the free booklet describing it in detail.

CALL OR WRITE FOR YOUR COPY

Reo Speed Wagons range from 1½ to 4 tons, $625-$2995. 32 wheelbases—4's—6's—8's. Tractor-Trailer units from 16,000 to 32,000 lbs. as low as $1575 for complete unit. All prices chassis f. o. b. Lansing plus tax.

REO MOTOR CAR COMPNNY
LANSING — TORONTO

ARMORPLY
A SUPERIOR METAL FACED PLYWOOD PANEL FOR BODY CONSTRUCTION
Write for samples and prices
UNITED STATES PLYWOOD CO. INC.
603 W. 36th. ST. NEW YORK CITY

WE'LL GIVE YOU

Enough O'Brien's 2-Hour Enamel (any color) to finish a set of fenders to prove to you that it's the most satisfactory and economical finish made for fleet maintenance. Use the coupon.

O'BRIEN VARNISH COMPANY
South Bend, Indiana

Gentlemen:
Send me enough O'Brien's Enamel to finish a set of fenders.

Name .....
Firm .....
Address .....
City ..... State .....

Sorting Parcels by "Round Table" System

AN idea long used on the Pacific Coast in retail store delivery station layouts, but introduced for the first time in Eastern territory about three months ago, has been attracting much attention among New York retail store delivery people. This is the new sub-station of the United Parcel Service in Hempstead, Long Island, employing instead of the conventional rectangular conveyor belt type of sorting system, a round-table or circular sorting and loading system.

The station was built as a full-size experimental laboratory and was put in commission about three months ago. It embodied ideas which the United Parcel Service has found practical in its operations on the Pacific Coast, notably in Seattle where the company began twenty-five years ago.

The round-table sorting and loading system has been used in the Seattle plant for a number of years. It requires fewer men to operate it and has greater flexibility in handling peak loads. In the New York territory volume fluctuations in retail deliveries are very much more pronounced than they are in other cities. By adopting the round-table sorting and loading system these fluctuations are more easily coped with. When volume is low, a minimum of help is required to sort the packages once they have been brought into the station from the various stores this company serves.

In the rectangular or conveyor system three or more people are required to operate it as against one operator necessary with the round-table set-up. On the rectangular system it is necessary to have a man to place the packages on to the conveyor belt, another man to mark them as they progress on the belt to the bins, and one or more men to remove them from the belt into the respective bins.

Under the round-table plan packages are taken direct from the pick-up cars, placed on the round table and without requiring route marking are lifted directly into the route bins which are located in a circular arrangement around the table.

The round-table system is especially adapted to stations from which no more than fifteen routes are covered, and from which a daily volume of around 3,000 packages is distributed. On the other hand the round-table system requires more floor space and that floor space must be especially adapted to it.

A Three-Million-Mile Fleet

IN the far-off Philippines is a fleet of passenger cars that has run up the staggering total of three million miles of service.

There are 50 Studebakers, all sixes, in this fleet. It is owned by the N. & B. Stable Company of Manila, operating an automobile and livery service. The actual total is 2,912,623 miles, or an average of 58,454 miles per car. Twenty-three of the cars have been in service since 1928 and their speedometers read from 73,707 miles to 86,096 miles. Fifteen more were added in December, 1929, and their mileages range from 55,587 to 67,414. In October, 1931, twelve more joined the fleet and have averaged approximately 15,000 miles each since that time.

The record of these cars is interesting in view of the fact they are performing daily in one of the hardest services a motor car can engage—taxi service. The terrific heat and salt air of the Philippine climate is a natural obstacle to long, efficient performance which the cars have proved their worth in overcoming.

Preventing Losses of Gasoline by Evaporation

LARGE quantities of gasoline are lost each year by evaporation from bulk-storage tanks, according to the results of a study of the subject made by the United States Bureau of Mines, Department of Commerce.

The tests made show that light-colored paints, tank-housing, and increased operating pressures, each materially reduce the evaporation losses of gasoline in bulk-station storage tanks. The results indicate that combinations of pressure with light-colored paints or tank housing would be most effective and economical in reducing these losses. It is believed that operators will find it economical to use relief valves that will close quickly and tightly as soon as the pressure within the tank is reduced to the operating pressure of the valves.

The rate of evaporation from bulk-station tanks is influenced by two principal factors: First, the vapor pressure of the gasoline in the tank; and second, the amount of "breathing" of the tank. The vapor pressures of the gasoline govern the amount of the gasoline vapor in the air-vapor mixture above the gasoline in a tank at a given temperature. The "breathing" of the tank is caused by the inflow of air from the atmosphere during certain periods of the day and the expulsion of the air-vapor mixtures at other times, caused by atmospheric variations.

Two of the most common methods for reducing evaporation losses from bulk-storage tanks are: The use of vapor-tight tanks equipped with relief valves; and reducing the temperature of tanks and their contents by painting them a light color, by insulation, and in some instances by using water sprays.

In order to determine and compare the effects of various colors, insulation, and pressure in reducing the evaporation losses of gasoline held in storage in bulk-storage tanks, the Bureau of Mines made observations on five horizontal tanks of 12,000-gallon capacity each, which were erected in Kansas City, Mo.

Each of the five test tanks were approximately 20 feet long by 10 feet in diameter fabricated from ¼-inch steel tank plates, and of welded construction. One tank was painted with two coats of white paint, and in addition was protected with an insulated housing consisting of a corrugated composition sheet siding or roofing attached to a welded steel frame. Another tank was covered with aluminum foil which was applied like wall paper. The third tank was painted red with an iron oxide steel priming paint. Although it is not customary to use red paint for the finish coat on bulk-storage tanks, this color was included in the test for comparison. Two tanks were painted with aluminum paint, using the commercial grade of aluminum powder.

All tanks were equipped with vacuum and pressure relief valves, vapor-tight gage batch and a manhole. One of the aluminum coated tanks was operated under a pressure of 5 pounds per square inch and four of the tanks were operated at 2 ounce pressure. All tanks were equipped with recording thermometer and pressure gages for continuously recording changes in temperature and pressure within the tanks.

The test period included those months in which the consumption of gasoline is the greatest and which comprise the hottest period of the year—the most conducive to the loss of gasoline by evaporation.

The tests show also the advantages of designing tanks for new installations to operate under at least 5 pounds pressure, and in the older installations of testing the tanks, and where possible of equipping them with relief valves which operate under at least 3 pound pressure.

A QUALITY PRODUCT

Gaskets for every Oil, Gasoline, and Water connection—not one missing—are immediately available, if you keep on hand a few yards of Vellumoid. Cut or tap them out as you need them—no trouble, no waiting, and each gasket is of the highest quality.

And for the cars, trucks, or busses in your fleet, keep on hand a supply of Vellumoid ready-cut gaskets. They do not stretch nor shrink, and are always ready for use.

Ask your Jobber

VELLUMOID
THE REAL REPLACEMENT GASKET MATERIAL

The Vellumoid Co., Worcester, Mass.

You Save Money

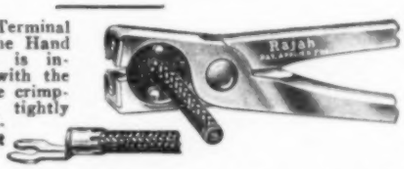
on rewiring jobs by using the new **Rajah** Hand Crimping **Tool**

This new tool crimps Rajah Terminals to ignition cable without the use of solder or any other tool. Note the simplicity of using it.

(Right) The cutter on end of Tool will remove just enough insulation.

(Left) Bend the exposed wire strands over end of Cable, then insert into ferrule of Terminal.

(Right) Now crimp Terminal to Cable by using the Hand Tool—The Terminal is inserted in the Tool with the ferrule flush with the crimping jaws—Compress tightly and you have a positive and **permanent** connection.



Tool with neat metal box containing 250 distributor terminals and 253 assorted spark plug terminals, $11.20. Tool alone $4.00.

THE RAJAH COMPANY, Bloomfield, N. J.

Send this coupon with your letterhead or business card for our special offer. You are sure to receive an unusual present. No obligation.

Name .....

Address .....

.....

☐ Proprietor ☐ Service Manager ☐ Shop Foreman ☐ Mechanic

Say "I saw it in FLEET OWNER"—It Helps!

A TRULY GREAT HOTEL

When you visit Detroit next time stop at Hotel Fort Shelby. You'll enjoy its thoughtful, efficient, unpretentious service . . . its savory foods and cozy, cheerful, charming rooms. ¶ Every unit in the Hotel Fort Shelby is paneled . . . servidor equipped . . . attractively appointed and popularly priced; all rooms have private bath and circulating ice water. ¶ Hotel Fort Shelby's location in the heart of Detroit's shopping, theatre, financial, insurance and wholesale districts is a happy one . . . no other large hotel in the metropolitan area is so near the principal railway terminals, airports and steamship piers. 900 rooms . . . many as low as $3.00 per day . . . suites $10.00 and upward.

Motorists are relieved of their automobiles at the door without service charge. Write for free road map, and your copy of "Aglow with Friendliness," our unique and fascinating magazine.

HOTEL Fort Shelby
"AGLOW WITH FRIENDLINESS"
E. J. BRADWELL, Manager
DETROIT

Bus a Factor in Gas Consumption

THE following is taken from an information circular issued by the Department of Commerce, United States Bureau of Mines, recently:

"As a factor in the determination of gasoline consumption, the revenue (common carrier) motor bus was almost twice as important in 1931 as in 1925, accounting for almost 3 per cent of the total domestic gasoline demand in 1931, as compared with 1.5 per cent of the 1925 demand. Quantitatively calculated gasoline demand of revenue busses has increased from 3,391,000 barrels in 1925 to 11,468,000 barrels in 1931."

Using a conservative figure of 14 cents a gallon, that would mean an expenditure of $51,376,640 for this one item alone.

How to Increase Tire Mileage

(Continued from page 22)

in demanding smooth pavements that *remain* smooth. Fleet owners pay a great part of the first cost and upkeep of these pavements through motor vehicle and gasoline taxes and are entitled to get a type of surface that will be easy on their tires and car.

The careful driver uses his brakes as easily as possible and never brings his car to an abrupt stop from high speed unless absolutely necessary. Sliding the tires on pavement, of course, tends to grind off the tread. Ordinary driving at uniform speed with little use of the brakes unavoidably causes some wear on the tires. To show how important this may be, reference will again be made to the report to the Highway Research Board at their 1931 meeting.

Desiring to determine the approximate rate of wear of different types of road surface on the tires, test runs were made on "non-skid" asphalt pavement and on portland cement concrete pavement of similar length, grade, etc.

A standard driving speed of 40 miles an hour was adopted and brakes were used only for easy stopping at each end of the test sections. Air pressure in the tires was checked frequently and careful record made of the temperature of the air, the tire and the road surface. A very delicate gage was used to measure the actual depth of rubber worn off the surface of the tire, the average being taken of a large number of readings at the end of each section of the test run.

The loss in weight of the tires was also checked carefully against the measurement of surface wear. The direct measurement of surface wear has been adopted, however, by tire manufacturers as the best available test since the rubber will pick up a certain amount of moisture from the air and oil and other foreign substances from the road surface which increases the weight of the tire and thus gives false values as to the amount of wear.

Approximately 3,000 miles were run on each type of pavement, using standard balloon tires on a 6-cylinder sedan weighing 3,490 pounds. The average wear per 1,000 miles of travel over the portland cement concrete pavement was only .0037 of an inch; on the "non-skid" asphaltic concrete, the average wear for every 1,000 miles of travel was .0067 of an inch, or, a driver would wear out 7 sets of tires in driving as far on the asphalt as he could drive with 4 sets of tires on the concrete.

At this rate of wear, tires good for 30,000 miles of driving on concrete would give service for only 17,000 miles on the "non-skid" asphalt. It is certain that in years to come, fleet owners will begin to pay more attention to the kind of pavement on whcih they drive, as well as increased service from the tires they buy.

TROUBLE SHOOTER

(You Ask 'Em — We Answer 'Em)

A department, devoted to correspondence from readers of FLEET OWNER. Any questions having to do with automotive service will be answered in this department. All properly signed inquiries will be replied to by mail and such of them as are believed to be of possible interest to other readers will be published in these columns.

Heaters for Truck Bodies?

Question: We would like to ask whether you have any information concerning heating apparatus to be used in truck bodies in cold weather to keep perishable merchandise from freezing. This would require something that would not do any damage on account of odor. If you have any information along these lines we would be glad to get it.—R. C. Co., Grand Rapids, Mich.

Answer: We regret that, so far as we know, there has not been a general demand for heating apparatus for the inside of truck bodies. It would seem to us that you could partially solve your problem by the use of insulated bodies, which would serve a dual purpose; that is, keep perishables cool in summer and warm in winter.

It might be possible to make use of a hot water heater, many of which are on the market at present; or you could build your own heater and circulate the engine water through pipes in the body. An additional pump may be necessary, however, and the radiator should be equipped with a shutter.

Should any of our readers have any experience with heaters in truck bodies (not in cabs) we shall be glad indeed to pass any information along to the inquiring operator. Send them to the Editor, please.

To Test Oil While in Truck Engine

Question: We would appreciate your answer on the following: A convenient and simple manner of testing crankcase oil in a truck engine to determine whether the oil should be changed or whether it is good enough for additional use, without removing the oil from the engine. Does it take costly equipment to determine the condition of oil?—P. I. C. Co., Ft. Pierce, Fla.

Answer: Many operators use the "finger test" which does not mean very much, except that their experience is probably their best guide. For instance, they have one man in their fleets, who is responsible for the lubrication. He, naturally becomes an oil "expert" in his own way, and at periodic intervals, pulls out the oil stick of each engine, and decides, by means of his fingers, whether or not the oil has sufficient "body" for further use.

Although oil engineers and scientists tell us that this "finger test" does not mean a thing (and they are undoubtedly right), yet many operators are able to get away with it by this method, and get surprisingly good results—at least they believe that they are getting satisfactory lubrication.

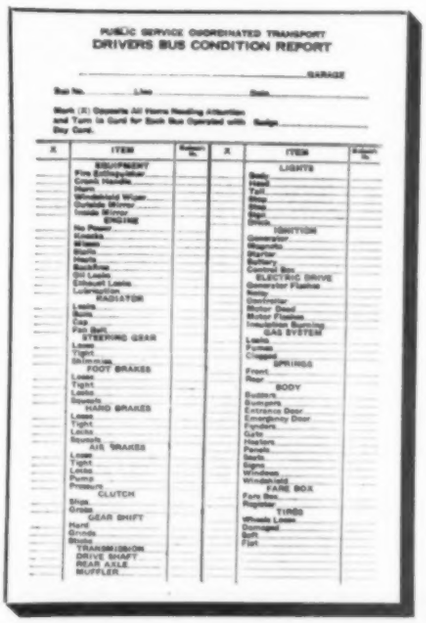
As far as instruments go, there are two, to our knowledge, that are now available in practical, useable form. These, to all outward appearances, are similar, in that they consist of a gauge-like instrument placed permanently on the dash of each vehicle, to which is connected an oil line from the pressure feed. The instruments indicate viscosity or body, and tell the exact condition of the oil, while the engine is running, and at all times. They also indicate when it is necessary to change the oil. These are not to be confused with the ordinary oil gauge.

Under separate cover we are sending you bulletins describing these two instruments, and you can take your pick, or write to the makers for further details.

(Editor's Note: Should other readers desire free copies of these two bulletins, just write to the Editor and ask for "Information on How to Test Oil in Engine." These will be promptly sent without obligation.)

Bus Operator Wants Driver's Report

Question: Can you send to us a form suitable for a bus driver to fill out when leaving his bus at the garage in the evening, showing what may be wrong, or any trouble needing the attention of the maintenance department. We would appreciate this.—F. A. Bus Co., Clearfield, Pa.



PUBLIC SERVICE COORDINATED TRANSPORT
DRIVERS BUS CONDITION REPORT

GARAGE

Bus No. ____ Line ____ Date ____

Mark (X) Opposite All Items Needing Attention and Turn In Card for Each Bus Operated with Badge ____ Day Card.

X	ITEM	Subject No.	X	ITEM	Subject No.
	EQUIPMENT			LIGHTS	
	Fire Extinguisher			Body	
	Crank Handle			Head	
	Horn			Tail	
	Windshield Wiper			Stop	
	Outside Mirror			Step	
	Inside Mirror			Dash	
	ENGINE			IGNITION	
	No Power			Generator	
	Knocks			Magneto	
	Misses			Coil	
	Stalls			Starter	
	Hunts			Battery	
	Backfires			Control Box	
	Oil Leaks			ELECTRIC DRIVE	
	Exhaust Leaks			Generator Flashes	
	Lubrication			Body	
	RADIATOR			Distributor	
	Leaks			Motor Dead	
	Boils			Motor Flashes	
	Cap			Motor Burning	
	Fan Belt			GAS SYSTEM	
	STEERING GEAR			Leaks	
	Loose			Fumes	
	Tight			Choke	
	Shimmies			SPRINGS	
	FOOT BRAKES			Front	
	Leaks			Rear	
	Tight			BODY	
	Locks			Buckets	
	Squeals			Bumpers	
	HAND BRAKES			Entrance Door	
	Loose			Emergency Door	
	Tight			Fenders	
	Locks			Cafe	
	Squeals			Floorboards	
	AIR BRAKES			Panels	
	Loose			Seats	
	Tight			Signs	
	Locks			Windows	
	Pumps			Windshield	
	Pressure			FARE BOX	
	CLUTCH			Fare Box	
	Slips			Register	
	Grabs			TIRES	
	GEAR SHIFT			Wheels Loose	
	Hard			Damaged	
	Grinds			Soft	
	Sticks			Flat	
	TRANSMISSION				
	DRIVE SHAFT				
	REAR AXLE				
	MUFFLER				

Answer: We are glad to send you several sample forms of this kind. For convenience of other readers, we are printing one herewith. Should different types of reports be required by fleet operators, we shall be glad to have you take advantage of our services. Just tell us your requirements and the information in our files is yours for the asking.

TROUBLE SHOOTERS' DEPARTMENT (*Continued*)

This Noise Will Cause No Damage

Question: We have two 1932 4-cylinder Dodge trucks which have a noise that sounds like the transmission is ripping apart. This noise occurs only when taking the foot off the gas pedal, going down grade. We have had a new transmission, differential, drive shaft and two rear axles installed, but the noise is still there.

We put new clutch discs in it and it eliminated the noise somewhat. Could you give me any advice as to what to do? The trucks are only two months old and the noise was there when we got them.—G. B., Dover, N. J.

Answer: We cannot imagine the noise you describe, particularly in view of all the work which you state has been done to the trucks. It seems that since these are new vehicles, this is a problem for the factory to solve and we are glad to pass your inquiry along to the proper factory officials for attention.

The factory officials state that this noise is due to torque reaction, which is transmitted from the engine, through the clutch, into the transmission. It has never been found objectionable or deteriorating in its effects, and it only occurs at a certain speed range when decelerating. It will cause no damage whatever, they state, so until such a time that the factory gets into touch with you, we would advise you to forget about it.

Which Has More Braking Power?

Question: Please decide this question for us. A claims that an engine has more braking power when going down hill in second speed, with the ignition turned off. B claims that there is no difference in braking power whether the ignition is either on or off? Which is right and what are the reasons?—T. S. Y., Toledo, Ohio.

Answer: B is right, in our opinion. Just try it for yourself and you will see that there is no apparent difference. Please bear in mind, however, that in both trials, the throttle of the carburetor should be *fully closed*.

Without going into the theoretical side of the question, it might not be amiss to warn A that the practice of going down hill with the ignition turned *off* is *bad*. This operation sucks gasoline into the cylinders and manifolds and if the ignition is *off*, the fuel remains unburned, washes the oil off the walls and dilutes the crankcase oil.

Then too, when the bottom of the hill is reached, the gas will be ignited and in many cases the flame shoots through the open exhaust valves, following the course of the unburned mixture, and if there is any appreciable quantity in the exhaust pipe and muffler, a muffler blowout is almost certain to occur. "Always leave the switch on" is the best advice we can give you.

Reduces Spark Plug Fouling?

AN outstanding advantage of free-wheeling not generally recognized is an extreme minimization of spark plug fouling, according to a prominent free-wheeling official.

The fouling of spark plugs, curbing their efficiency, and shortening their life, is commonly caused by the inability of a decelerated motor to ignite the gasoline and oil pumped into the cylinders when the car is coasting.

"When a car is moving down-grade, as an example, the driver usually decelerates, and the car moves ahead under its own momentum," he said. "Unless the car is in free-wheeling, the engine is forced to turn at car speed instead of idling, with the result that gasoline and oil is forced into the firing chambers without a proper amount of oxygen, and faster than it can be ignited. It is this fuel which reaches the firing points of the heated spark plug that causes fouling.

"The car equipped with free-wheeling which coasts under its own momentum merely rolls ahead while the motor, temporarily disconnected from the drive shaft, drops to proper idling speed. It is then impossible for the wheels to force the speed of the engine and only the fuel necessary for efficient combustion is drawn into the cylinders.

"Thus, free-wheeling has been able to minimize one of the leading causes of needless expense and inconvenience in the operation of motor cars," he said.

Adjusting Light Truck Oil Pressure

Question: One of our drivers with a 1928 G. M. C. truck, having Pontiac engine, came in during a recent hot spell and claimed that the oil gauge did not show much pressure. We made an adjustment and now the hand goes all the way to the top of the gauge, even when the engine idles. Is this all right?—B. G. Washington, D. C.

Answer: No; at slow idling speeds the hand should be between five and ten pounds. The best way to make a good adjustment for ordinary driving is as follows:

Let the engine run until it is good and warm; in fact the oil should be thoroughly warmed up by running a few miles at least. On the left hand side of the engine, down near the splash pan, the adjusting screw is located. Run the engine at a speed equivalent to about 25 miles per hour and turn this screw anti-clockwise until the pressure goes down to about 12 lbs. At maximum engine speed the pressure should read between 20 and 30.

Get your adjustment by turning the screw; clockwise will increase the pressure and the reverse order will decrease it. Be sure to securely tighten the lock-nut so that no oil will leak out. It is advisable to use a new copper-asbestos gasket here.

Idling Motors in Winter Dangerous

IN a letter just sent to 18,000 commercial and industrial automotive fleet owners and maintenance directors, National Carbon Company, Inc., issues a warning against the dangers of idling motors in winter.

"Leading manufacturers of trucks have specifically warned owners against the false economy of idling engines in winter," the letter states. "It is pointed out that this practice wastes fuel costing more than anti-freeze; that excess crank-case dilution takes place and results in increased engine wear and oil consumption."

The necessity for operating motors at the temperature at which they function most efficiently is also pointed out in the letter.

"If a truck motor is designed to operate most efficiently at 190°, it should reach that temperature at all seasons of the year—even in winter when anti-freeze is being used.

"Since the boiling point of the coolant is the highest temperature the motor can reach, it is therefore important that the anti-freeze used have a sufficiently high boiling point to allow the maximum temperature needed for proper operation of the unit at high speed or under heavy load."

WHAT DO YOU READ?

HERE'S a hand-picked assortment of literature that is offered to you entirely without obligation.

We've even made it easy for you to get it. Fill in the coupon below, mail to the Editor, and let us do the work. We'll ask them to send it at once and not to bother you with salesmen, either.

61. Getting After Mr. Emergency. Here's some new literature on a new type of emergency brake that will really stop your truck or bus in an emergency, we're told. We also have learned that it's quite easy to adjust it or reline it and that even your dumbest driver can do it while he's eating his lunch at the "Greasy Spoon." If emergency brakes have been a bane and bugbear to you in the past, this new literature, which happens to be No. 61 in our listing, will prove of interest.

62. Power Prover Proves Proper Power. Gasoline is exploded or burned in the engine to generate power. Usually, the gasoline is not completely burned and is carried out through the exhaust. How to eliminate this waste and hazard of dangerous fumes is but one of the functions of the "Power Prover." If your curiosity has been aroused and you have the slightest interest in what started out as a real tongue-twister, just place No. 62 on the coupon below and you'll get the dope without obligation.

63. Tire Wear on Trailers. Prematurely worn tires are costing trailer operators everywhere a good share of their profits every year. A special study of trailer tire wear has been prepared and an interesting book gives the correct remedies that will save operators lots of money. In fact, this book gives reasons that you never dreamed of. Cut down these losses and start now by asking for No. 63—it's free.

64. Warm Enough for You? Although it's about 70 in the shade while this is being written we know of some interesting literature on anti-freeze that all of us will soon have to think about. One of the claims of this particular anti-freeze is that it prevents corrosion. Don't expect it to cure Halitosis, Athlete's Foot, Driver's Back or Stenographer's Hangnails, however, but let the literature tell you how good it is supposed to be. Ask for No. 64.

65. No Time Like the Right Time. If you were told that all of your engines were running out of time, you would not believe it. If you want someone to prove this to you, fill in No. 65 on the coupon below. This is about something that will prevent "spark-knock" and allow your engines to develop the proper "power-curve." At any rate it's mighty interesting reading.

66. Truck-Built Trailers. We've always thought that if trailer parts were interchangeable with truck parts, it would be a good thing for all operators. Number 66 brings a set of interesting literature on a complete, new line of truck-built trailers. Begin now to increase your payloads by sending for this free information.

67. No More Fuel Pump Failures. Such is the claim made for a new fuel pump that is built without contact points, diaphragm, or bellows. It's an electrically operated job, too. If you would like to see how it works, just fill in No. 67 and you'll get the full details at once without obligation.

68. Live Wires. This time it is the name of a new talking picture, but it's one that you, as a fleet maintenance man, will be interested in. Number 68 will not only tell you where you can see it free of charge, but will bring a complete set of ignition cable bulletins as well. The picture tells about ignition cable troubles and points the way to surer operation and lower maintenance costs.

69. Potatoes are Cheaper. Yes, and so might insurance premiums be lowered. One of the factors bringing this about is the use of safety glass. Number 69 will bring, free of charge, an interesting set of literature on safety glass that ought to enable you to "chisel" some savings next time your insurance man comes around. At any rate, it's lots better to be safety-glass equipped and the literature will tell just what it costs.

70. Taking a Slap at Piston Slap. The title is ours, but the device is Perfect Circle's. This prominent piston ring maker has combined its resources to produce a really effective piston expander to overcome even the worst cases of piston slap. Just jot down Number 70 on the coupon below and you'll get the dope without obligation. If you want a free piston ring size book, add Number 70a.

71. Air-Fuel-Ratio-Analyzer. Whoa! Don't think we're going high-hat with a lot of high-sounding engineering terms, for we're not. This literature describes an interesting device that enables even your dumbest mechanic to make the most efficient carburetor adjustment with his hands tied. It also, if properly used, will bring about considerable gasoline savings in your fleet. This is not a trick carburetor mixer, but is a scientific instrument built into inexpensive, practical form, especially for fleet owners. Number 71 will bring the full details and you needn't feel obligated, either.

72. Shop Kinks for Chevrolet. Don't tell us that you have no Chevvies in your fleet. Most fleets have 'em and for this reason we think this new, illustrated book of short cuts in servicing will appeal to a majority of our readers. Number 72 brings it without charge, but here is the catch: It also illustrates and describes several new tools especially designed to make Chevrolet jobs easy ones. The tools are illustrated, described and priced, but you don't have to buy any in order to get the book, which is free.

73. Cooling System Manual. Each year at this time a manufacturer of anti-freeze brings out a well-written book on cooling system servicing. It tells you how to get the most out of your anti-freeze during the winter months, and, regardless of the brand of anti-freeze you will use, it contains a lot of information on radiators, water pumps and related cooling system parts. Number 73 brings this manual, free, of course.

74. Windshield Wiping a Cinch. Here's a new heavy-duty windshield wiper that looks like it will really remove snow, ice, sleet and water from your windshields, no matter what your experience has been with previous wipers. It's claimed to be fool-proof, too, since it's not electrically, air or vacuum-operated. Puzzle: How does it work? For the answer just fill in the coupon with No. 74.

The Editor, ... 1932
FLEET OWNER,
90 West St., New York, N. Y.

Kindly send me without obligation, the following free books mentioned in the .....issue. (Literature will not be sent unless firm name is given.) Order by number.

....

....

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Firm Name .....

Address .....

City and State .....

Your Name .....Position .....

Maintaining a Parcel-Delivery Fleet

(*Continued from page* 12)

ience with both methods, that for commercial work, especially where wooden bodies are used, that the varnish process is better and cheaper.

We have no regular paint schedule but bring in cars as soon as they begin to look shabby. We do feel that they should be varnished on an average of every six months, however, in order to keep them up to our standard of appearance. Some jobs, of course, last over a year and some only three or four months, depending largely on the care given them by drivers. Tree scratches on panel jobs bring many cars into the paint shop prematurely.

Gasoline consumption is another important part of our costs. It may amount to 25 or 30 per cent of our total direct cost. We must do everything possible to curtail the waste of this expensive commodity.

Habits of drivers are a big factor here again. There is probably more gas consumed by idling motors in a congested delivery district than is actually used in running the cars. We must use every means in our power to persuade drivers to shut off their motors when they are leaving their cars stand for more than a minute or two. Many a driver lets his motor idle during his entire lunch period. If we are going to save gasoline, we must gain the co-operation of the driver. This can be done by educational talks and bulletins and by penalties. There should be a severe penalty, perhaps a day or two lay-off, inflicted on drivers who are chronic offenders.

It is possible to set a standard of gasoline consumption for each route and insist that drivers live up to this standard. We are working out something along this line now and expect to achieve a marked saving in gasoline when we have completed our work. I believe it quite possible to make a saving of 10 per cent.

However, the drivers cannot do it all. We must look to the condition of our carburetors, ignition systems, valves and rings. Here is where we can use to advantage one or another of the various good valve seat renewing and reconditioning outfits which are being offered today by various manufacturers. It is my belief that too much pains cannot be taken with valves. They can do a lot for us. Good valves are, of course, of no value to us unless the cylinder walls and piston rings are kept in reasonably good shape.

Ignition systems and carburetors are so obvious that they usually get attention. If they cease to function the motor stops and they have to be attended to. Valves and rings on the other hand do not cause immediate trouble and it is easy to ignore them.

In order to get the best gas mileage we must have good compression, good ignition and good carburetion. We can in many cases reduce our total maintenance cost by spending money on motor and motor accessory work. There is a possibility of saving from five to ten percent of our gasoline here.

I will not go into the general subject of lubrication in this article, except to say the very obvious thing, namely, that cars and trucks must be greased on schedule and the crankcases filled with a good grade of oil of the proper viscosity.

(Editor's Note: We have in the course of preparation, several more articles by Mr. Bixby, of United Parcel Service, author of the foregoing treatise. These will deal with the balance of the subjects mentioned in the first paragraph of this article, namely, Standardization of Motor Equipment; Selection and Care of Tires; and Cost Keeping. These articles will appear in early issues of FLEET OWNER. Watch for them!)

Self vs. Outside Maintenance

(*Continued from page* 14)

Among other facts developed by this study, this rather startling information was brought to light, namely, that 45.8 per cent of the maintenance work of these operators was performed by outside agencies. In other words, both the fleet operators and the outside agencies were dependent upon agencies other than their own, to do a large portion of their work.

The importance of self vs. outside maintenance will grow with the growth of this young industry. It is deserving of much thought and study, and FLEET OWNER is to be congratulated for bringing the matter before its readers.

Straight Line Method Cuts Costs

(*Continued from page* 16)

4. Regular overhaul of all equipment including trailers.
5. Complete painting of all equipment at least once a year.

The cost of fuel and lubricants is one of the major items of expense and naturally, is very closely scrutinized, not with the idea of reducing first costs, but from the standpoint of real economy. It is an item of more than passing interest and for that reason the company uses the very best obtainable for its purpose.

How to Train Your Driver Personnel

(*Continued from page* 18)

8—Blame yourself first, for each accident that occurs.

9—Be fair, but mete out whatever discipline the case calls for.

10—Show no special favors toward any one of your men, but never stop trying to hold the confidence of them.

11—Always be ready to receive ideas or suggestions from your men. This is a good way to get their cooperation on "safety".

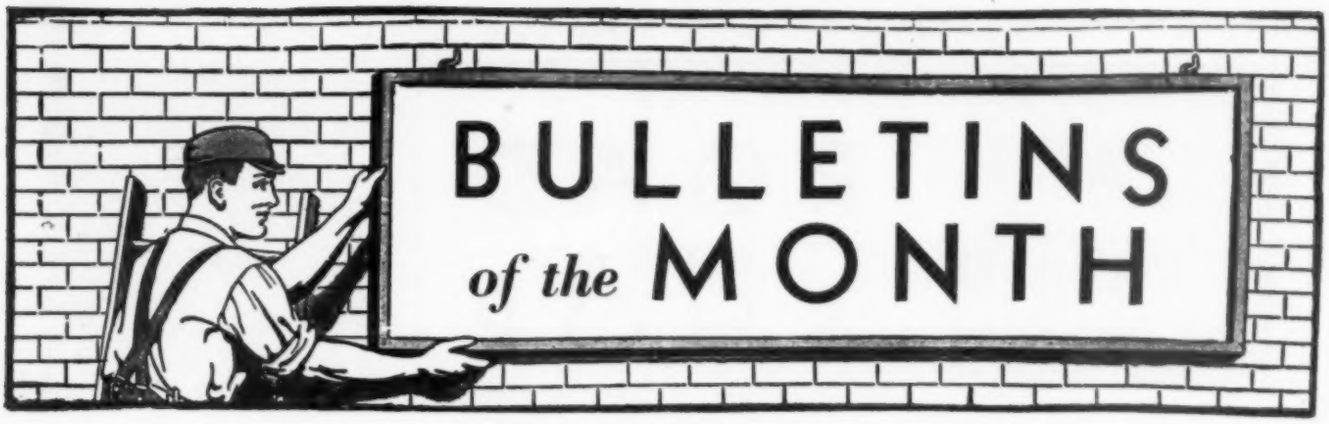
12—Remember your employer pays the bills for the accidents, but the cost is chargeable to you.

13—Your delivery organization is just what you make it. You being responsible, your boss looks to you.

The law of laws by which we live is "Safety." In nations, it is "Safety" against "Aggression." In individuals, it is "Safety" against "Accident" and the avoidable vicissitudes of life.

The willingness to take risks is in the great merchant or capitalist, a virtue, so long as those risks are taken solely with financial stakes. It is to him what courage is to a soldier or imagination to a poet. But the willingness to take risks with human life is a "weakness". Yes, even a "vice". The converse of the vice of gambling is the virtue of care.

Editor's Note: Mr. Mathot is Safety Engineer for The Globe Indemnity Company of Pittsburgh, Pa. The foregoing rules which he has given for training drivers were originally set forth in an address delivered before the recent Convention of the Retail Delivery Association at Pittsburgh, Pa.



GREATLY improved business prospects for 1933 have caused the eyes of the whole maintenance division of the automotive industry to turn towards Detroit where the Third Joint Trade Show of the Motor & Equipment Manufacturers Association and the National Standard Parts Association will be held during the week of December 5th to 10th. More than 200 leading makers of accessories, parts, tools, shop equipment and supplies will exhibit their wares.

THE rumor that Plymouth would shortly introduce a new, low-priced six, has been substantiated last month by Walter P. Chrysler. It will be a six-cylinder Plymouth with Floating Power and will carry the lowest price ever placed on a Chrysler product, a factory bulletin states.

ST. PAUL is to be made the pivotal headquarters for the distribution of Brockway trucks for five northwestern states, according to Robert F. Black, president. Wm. F. Sailor and James V. Murphy will head the new distributorship, to cover Minnesota, North Dakota, South Dakota, Montana and Wisconsin.

ON the basis of reports received for the first eight months of 1932, the Ford Motor Company now leads in sales of commercial cars and trucks throughout the U. S., a spokesman for the Company recently declared. The official reports of registrations throughout the country showed total Ford sales of 45,857, or 35.2 per cent of the total of 130,376 units of all makes registered in the eight-month period.

AT its annual business meeting in Chicago, Ill., on September 28th last, the American Electric Railway Association voted to change its name to American Transit Association. Member companies for some years have been coordinating with their rail service, various other means of transportation. The new name, therefore, indicates more properly the Association's broadened field.

FRANCHISE for selling and servicing Reo passenger cars and trucks has been awarded to Reo Sales & Service, Philadelphia, Pa. The new salesrooms are at 907 N. Broad St., in the heart of automobile row. W. J. Culverhouse, an old Reo factory man, is manager of the new organization. Complete stocks of parts for both cars and trucks will be carried, the report states.

AN order for 435 six-cylinder trucks, costing more than a million dollars, to be used by the Government for pickup, relay and delivery of the mails, was awarded recently to The White Company, Cleveland, Ohio, by the U. S. Post Office Department, Washington, D. C., it is announced by White officials.

LICENSE to sell "floating power" engine mountings as replacements for Ford cars has been granted to Skinner Motors, Inc., of Detroit, makers of the well-known and successful Skinner Oil Reclaimer. The company will distribute the rubber and steel parts which serve to support an engine in accordance with the "floating power" principle. The license limits this activity to replacement engine mountings for Ford 4-cylinder cars. Complete details may be had by writing to Skinner Motors, Detroit, Mich.

FORMATION of a Canadian company, the Toledo Steel Products Co., Ltd., is announced by Toledo Steel Products Company, Toledo, Ohio. The new company will regulate the sale and distribution of valves, bolts and bushings and water pump parts made by this firm, throughout Canada, and will have general offices at No. 2 Breadalbane St., Toronto, Ont., Canada.

FOR the first time in motorcycling history, motorcycles are now available with radio sets. The Indian Motorcycle Company of Springfield, Mass., announces that its 1932 police models are being equipped with radio receiving sets as optional equipment and that several police departments have already ordered it. Bosch, 7-tube radios are used.

IN order to more effectively place at the disposal of its customers the combined sales, engineering and manufacturing facilities of its various subsidiaries, the Marlin-Rockwell Corporation, Jamestown, N. Y. have consolidated the sales activities formerly carried on independently by them. These include: Gurney Ball Bearing Division, Standard Steel & Bearings, Inc., and Strom Bearings. Sales offices will be maintained at Jamestown, N. Y., Plainville, Conn., and Chicago, Ill.

ANNOUNCEMENT is made of the appointment of Grace & Holliday, Detroit, as advertising and merchandising counsel for the new line of Continental motor cars, by W. R. Angell, president of Continental Motors Corporation. The new line will include passenger cars, produced in the Continental factories.

MORE Perfect Circle piston rings were sold in Canada during August than any other August in Perfect Circle history. Sales for that month registered a gain of 10 per cent over August, 1931. Perfect Circle's new product, a piston expander, was introduced to the U. S. and Canadian trade last month. With the addition of this new product, sales for 1932 are expected to exceed those of 1931 by a good margin.

OIL experts in the laboratories of the Pennsylvania Grade Crude Oil Association, under the direction of Dr. M E. Fenske, have developed, as their latest achievement, a new chemical compound which, when used, raises the viscosity index of the resultant lubricant far higher than is commercially practicable, according to a recent announcement. The new chemical is a solvent, to be used in the refining of lubricants.

THE appointment of E. O. Holmgrain to the engineering staff of the Federal Motor Truck Company, Detroit, Mich., was recently announced by M. L. Pulcher, president of that corporation. Mr. Holmgrain's work will be confined principally to experimental activities. He was formerly with La-France-Republic Truck Corporation.

AN increase in the number of retail deliveries made by Dodge dealers is reported. For the week ending October 1st, truck sales increased 28.9 per cent. It is pointed out that the increase is not due to seasonal or quantity purchases, but that it is a fair sign of improved conditions throughout the country.

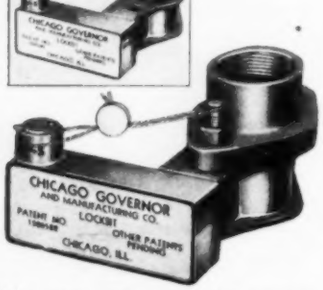
DIRECTORS of the Four-Wheel-Drive Auto Co., Clintonville, Wis., authorized the payment of the semi-annual 3% cash dividend last month. This dividend on the outstanding common stock is paid regularly on April 1 and October 1 of each year.. The company has no issue of preferred stock and reports no bonded indebtedness whatsoever. The FWD Company has produced heavy-duty, four-wheel-drive vehicles for the past 22 years.

FOUR manufacturers were recently elected members of the National Standard Parts Association. They are: Garlock Packing Co., Palmyra, N. Y.; Blackhawk Mfg. Co., Milwaukee, Wis.; Ditzler Color Co., Detroit, Mich., and MotoMeter Gauge & Equipment Corp., Toledo, Ohio.

for ROAD *and* SHOP

Chicago "Locksit" Governor

A NEW governor for cars, buses and trucks that both locks and seals against tampering, has been announced by the Chicago Governor & Mfg. Co., 505 S. Laflin St., Chicago, Ill.



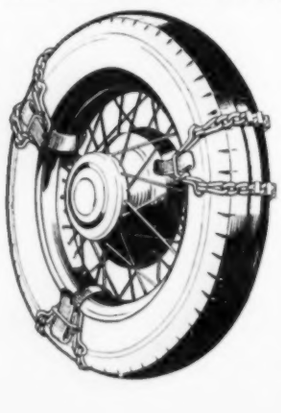
This new governor, known as the "Locksit" governor, is set with a key, after which a wire seal is passed through both the lock and the stud, making it impossible to change the "set" of the governor, even with a duplicate key, without breaking the seal.

In keeping with the present-day trend, the new Locksit governors are being offered at low list prices, the makers point out, and that, like all Chicago governors, they carry an all-time guarantee to control accurately both the engine and traveling speed, under all loads, for the life of the engine.

For further details, prices, etc., write directly to Chicago Governor & Mfg. Co., mentioning this publication, please.

Weed Emergency Unit Chains

A NEW emergency unit chain for passenger cars, which has several distinctive features, has been announced by American Chain Company, Inc., Bridgeport, Conn., makers of Weed tire chains.

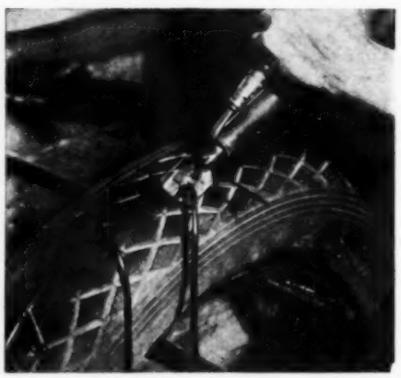


Each Weed emergency unit chain for passenger cars has two cross chains attached to unique side members. The cross chains are made of Weedalloy the new, tough, long-wearing metal which is used in Weed American tire chains and have bar reinforcements double-welded to the contact links. A strong, weather-proofed fabric strap with a quick-adjustable, tight-holding buckle holds the unit in place on the tire. The special buckle does not require holes in the strap, which permits close adjustment and tight fit.

Either three or four units may be used on each tire. They are made in two sizes which fit all tires from 4.40 to 7.00 inclusive and can be used on wood or wire wheels. For replacement purposes standard cross chains are used.

Tire Retreading Tool

A NEW tire tool which recuts treads in any standard make tire, where sufficient rubber remains, and makes non-skids out of "bald heads," has been put



on the market by a newly developed company, the Kwick-Kut Manufacturing Company, Inc., 3821 Arsenal Street, St. Louis, Mo.

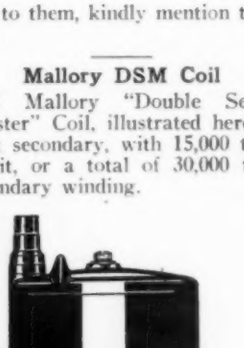
The new tool, an electric hot knife tire groover, is being used with much success by companies operating fleets of automobiles. It is said that tires worn smooth can be regrooved and made non-skid again, affording thereby, several thousand extra miles of safe tire service.

The newly invented tool has been approved by tire and automobile manufacturers and has been favorably commented upon by many prominent men in the automotive industry. The tool is made in several models ranging in price from $4.50 to $30.00.

The Kwick-Kut Manufacturing Company, Inc., is offering a free catalog which illustrates the various models of the tool and describes its use. When writing to them, kindly mention this publication.

Mallory DSM Coil

THE Mallory "Double Secondary Master" Coil, illustrated here, has a two-unit secondary, with 15,000 turns on each unit, or a total of 30,000 turns in the secondary winding.



It is claimed by its makers to produce a spark that will start any engine from only 2 volts, and to provide exceptionally hot sparks over the entire throttle range. It is also said to meet the requirements of an eight-cylinder engine turning up to 5,000 r.p.m.

The windings are hermetically sealed in a bakelite case, instead of metal. The top, or cover, carrying the three terminals, is of natural bakelite, from a new formula, said to be the highest arc-resisting material known. Thus short circuits are prevented, even when the coil is subjected to moisture.

This new coil is made in various models and can be used on 6-volt systems, and on 12-volt systems in conjunction with a special resistance unit. For prices and literature, write to Mallory Electric Corporation, Vancouver Ave. and P. M. R. R., Detroit, Mich.

New Literature on Brake Drums

A NEW bulletin of special interest to manufacturers, owners and operators of heavy-duty trucks and busses, and illustrating and describing the complete line of chrome molybdenum cast iron brake drums manufactured by Kay-Brunner Steel Products, Inc., is now being distributed by the Company.

This bulletin can be secured by writing the manufacturers at Alhambra, California or 620 South Delaware Avenue, Philadelphia, Pennsylvania, mentioning FLEET OWNER, of course.

NEW STUFF *for* ROAD *and* SHOP (*Continued*)

Victor "Metalbac" Gasket

A NEW type of gasket designed and patented by the Victor Manufacturing & Gasket Company of Chicago, has recently made its appearance.

Known as Metalbac, it is made of one layer of steel and one layer of specially treated asbestos millboard. The steel layer is formed to protect the edges of the asbestos around the cylinder openings, water holes, bolt holes and outer edges. The exposed surface of the asbestos is graphited. The gasket is highly resistant to the effect of heat and pressure and is practically proof against damage in handling or when installing. The Metalbac gasket approaches copper asbestos in its sealing qualities and is lower in cost even at the present metal markets.

The Metalbac gasket is adapted to cylinder head and manifold gaskets. It has been approved by several leading car manufacturers and several million of the gaskets are already in service.

An illustrated circular describing the gasket more in detail has been issued by the Victor Gasket & Mfg. Co., Chicago, Ill. Copies free on request.

Simmons Motor Hoisting Eye

SIMMONS, of Cleveland, Ohio, recently announced the production of a Motor Hoisting Eye. It is a strong, durable forging which makes motor hoisting a much easier and faster operation than ever before.

The eye screws into the spark plug hole. Then the chain-hook or clamp is slipped through the eye and the motor is lifted safely and quickly. The old, awk-

ward method of slinging chains under the motor, which often results in damage to the carburetor and distributor, etc., is eliminated.

The eye comes in three sizes which correspond to the three most widely used spark plugs. Further information may be had from jobbers or The Simmons Manufacturing Company, 3405 Perkins Avenue, Cleveland, Ohio. When inquiring, please mention FLEET OWNER.

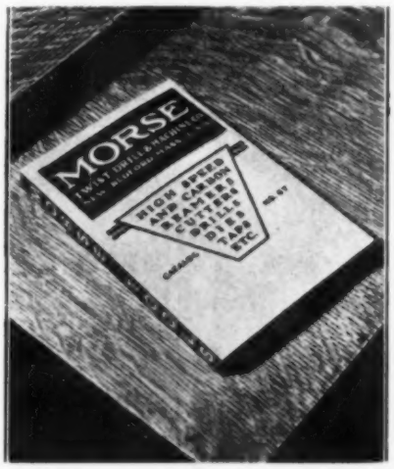
Colors for Truck Tires

A NEW finish for side walls of automobile tires, in a wide assortment of colors, is being produced by Berry Brothers, well known manufacturers of lacquers, varnishes and paints, and offered under the trade name of "Tirelac" to commercial car and truck owners through automobile and truck dealers, tire dealers and accessory and supply houses.

The new product has a wax base and is said to be easy to apply, very elastic, fast in color, easy to keep polished with a soft cloth, and also a good rubber preservative.

The colors include cream, light gray, dark gray, bright red, dark red, blue, tan, green, black and white. Applied to tire walls tirelac improves the appearance of any motor vehicle and is inexpensive, compared with the newly developed colored sidewall tires recently offered at extra cost by several tire manufacturers.

New Small Tool Catalog



THE Morse Twist Drill & Machine Company has recently issued an attractive new catalog in which is described their entire line of Drills, Reamers, Cutters, Taps, Dies, Screw Plates, Sleeves, Sockets, and Gauges.

It is a handy guide for the purchasing agent and shop superintendent. Your file to be complete should include this up-to-date catalog which also contains helpful data and tables useful to all small tool users.

Send for your copy to the Morse Twist Drill & Machine Company, New Bedford, Mass. There's no obligation, of course, and you'll mention FLEET OWNER when writing, won't you?

Book on Low-Pressure Tires

DATA affecting every phase of the new low-pressure tires, entitled "Data on Goodrich Flying Silvertowns", has been published by The B. F. Goodrich Company, and copies are now being distributed. The publication gives information on the following:

Tire sizes and cars suitable for them; wheels; effect on gear ratio; disc wheel specifications for low-pressure tires; effect on fuel consumption; effect on speed; clearance; fender mountings of spare tires; wheel shimmying tendencies and methods of overcoming it; pressure gauges and wheel jacks; how to get the best service from the new low pressure tires.

Introduction to the booklet says: "Low-pressure tires are a product of research and development over many years. The transition from high pressure tires to regular balloon tires several years back demonstrated what a remarkable contribution toward better motor car efficiency is possible in tires of larger cross section."

Copies of this book may be obtained free of charge by addressing B. F. Goodrich Company, Akron, Ohio, mentioning this publication, please.

Improved Emergency Tire Chain

A NEW emergency tire chain is offered by Columbus-McKinnon Chain Corp., Tonawanda, N. Y., bearing the "CLAW" trade-mark.

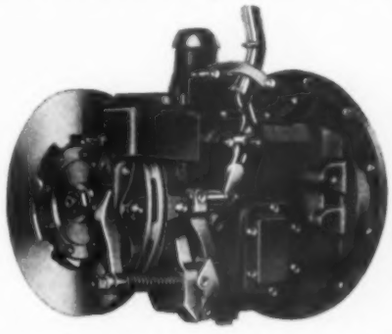
The new chain buckles on like a belt, the locking device closing with a downward pressure. The strip is of four-ply, rubberized fabric that is claimed to remain flexible in the coldest weather.

Two cross-chains are used in each unit. Side plates are made of heavy steel to stand severe abuse, the makers point out. For further details address the manufacturer above. You'll mention FLEET OWNER, won't you?

Optional on Studebaker Trucks

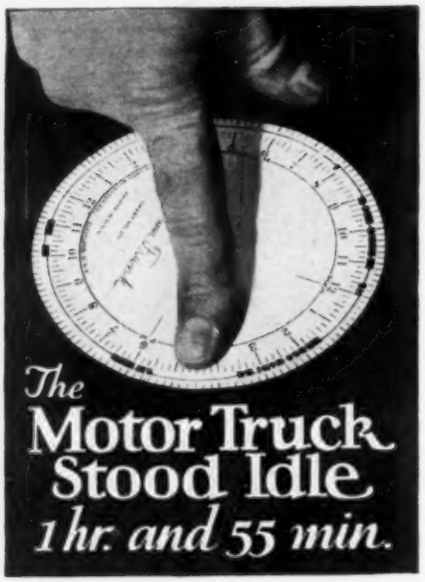
ANNOUNCEMENT has been made that Tru-Stop Ventilated Disc Brakes can now be supplied as optional equipment on Studebaker Trucks.

For the Tru-Stop Brake its makers claim that it is more than a mere parking brake and that it is a real emergency brake, built for the split-second braking



action demanded by modern speeds and traffic conditions. Positive, even braking pressure is applied without a trace of chatter or injury to driving mechanism, they explain.

In addition to its unique, ventilating, self-cooling disc, it has other features which make for economy in service. Adjustment can be made quickly and easily, while relining is only a matter of minutes. For literature and full information address American Cable Company, Bridgeport, Conn.



And You Can Put Your Finger Right On It!

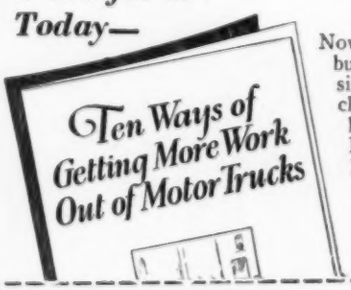
WHAT does it cost when your motor truck stands idle somewhere for an hour and 55 minutes? It costs pretty close to $8.00! That's plenty, we'd say.

One thing is certain, you never realize it until you SEE it. And when you see it in chart form (like the *Servis Recorder* chart above) then, we repeat, you can put your finger right on those delays; and then you'll know what to do, all right!

A Truck Can Easily Waste $500 a Year!

Why allow it, when the *Servis Recorder* can prevent these costly delays? All you need is a screwdriver—why, you could *NAIL* this *Servis Recorder* on your truck, and it will automatically give you every day this "picture" of the work your truck did during the past 24 hours—the heavy marks on the chart registering the truck *at work* and the spaces in between showing when it was *idle*.

Write for it Today—



New 7-Day Model

Now you can get a 7 days' busy-idle record on a single chart without changing. When you lock the new 7-Day Recorder, you don't have to touch it again for a week! The coupon brings the whole story.

THE SERVICE RECORDER CO. F.O. 3
Hanna Bldg., Cleveland, Ohio

Please send us, without obligation, "10 Ways of Getting More Work Out of Motor Trucks."

Company .....

Attention of .....

Street .....

City & State .....

The Service Recorder Company
Cleveland, Ohio

THE SERVIS RECORDER
"Keeps Trucks Busy"

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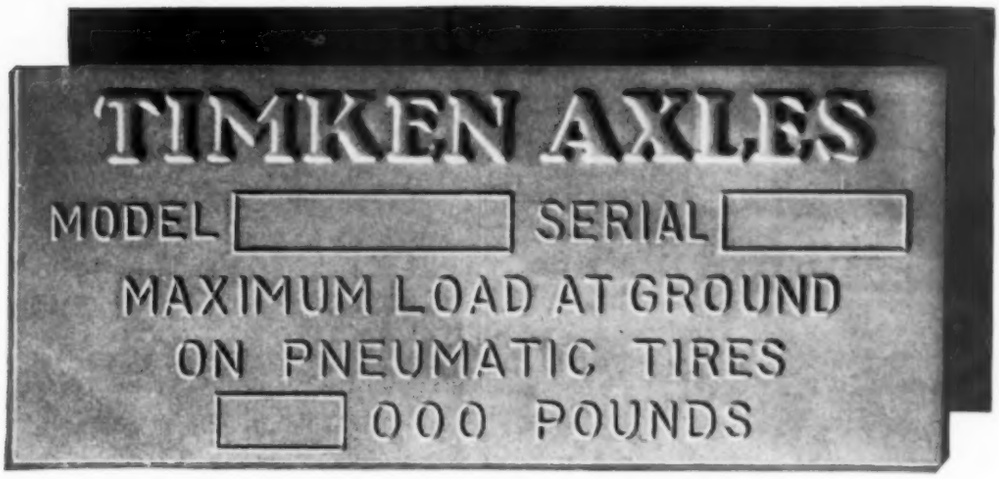
Libbey-Owens-Ford Glass Co.	2nd Cover
Mallory Elec. Corp.	39
National Carbon Co.	23
O'Brien Varnish Co.	40
Packard Elec. Co.	25
Peck Spring Co.	38
Pep Mfg. Co.	5
Perfect Circle Co.	26 & 27
Rajah Co.	41
Reo Motor Car Co.	40
S.K.F. Industries, Inc.	—
S. P. A. Truck Corp.	4th Cover
A. Schrader's Son, Inc.	29
Service Recorder Co.	50
Skinner Motors, Inc.	13
Sponge-Aire Seat Co.	40
Sunnen Products Co.	—
Timken-Detroit Axle Co.	3rd Cover
U. S. Axle Co.	17
United States Plywood Co.	40
Vellumoid Co.	41
Wadsworth Core Machine & Equip. Co.	—
Welch Pac-less Pump Co.	—
Woodward Hotel	38

Tell Them You Saw It in

"FLEET OWNER"

They'll Appreciate It!



This plate . . is a *Guarantee of Satisfaction*

TWO trailer-axle problems have been created by modern transportation — brakes and pneumatic tires.

There is just one way, we believe, to solve both with profit and satisfaction — Timken Tubular Axles for trailers.

On each Timken Tubular Axle appears the Timken capacity plate. It is more than a yard stick of load capacity; it is an assurance of Timken quality, of Timken engineering skill and experience. It supplements the trailer manufacturer's own guarantee that all other parts are of similar excellence.

These axles are engineered (1) to withstand braking torque—designed for and equipped with any type of brakes you want; and (2) to assure proper, even load distribution on pneumatic tires, *preventing* excess wear so common on trailer tires today.

So important is this whole subject that we have made exhaustive studies of both trailer brakes and trailer tires. The facts are set forth in booklets which are worth thorough attention of any trailer operator. They will be mailed on request.

You may have Timken Tubular Axles on new trailers by specifying them.

If your present trailers need brakes or show excess tire wear, it will *pay* you to put Timken Tubular Axles under them. They will save their entire cost in one set of dual pneumatics. Write us, or get in touch with your local distributor.

THE TIMKEN-DETROIT AXLE COMPANY DETROIT, MICHIGAN

What a Truck!

Look at that cab! Neat! Comfortable! Lots of room for big men under the wheel—easy to get in and out of. Here's another point: it's fully insulated from the all steel dash. The battery can be serviced through that outside door in the skirt.
There's a frame that will stand up and take it! Seven inches deep, with cross members that fill the entire channel.
Any way you look at it, you can see why Studebaker moved so swiftly up among the leaders. More than 100 different lines of business have purchased Studebaker trucks
The 75 horsepower engine under that hood is so well designed and built that it develops a full flow of economical power at LOW engine speeds.
Do you know that 42 two-ton trucks averaging $1889 have the same rear axle as this $895 Studebaker?

1½-ton	$ 670 to $ 745
2-ton	895 to 945
3-ton	1350 to 1425

All prices chassis at factory. Bumper, spare tire extra. Cabs and all standard bodies available on all chassis.

Studebakers *are profit makers*